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Original Articles

A REPORT OF A SERVICE WITH THE FIRST HARVARD SURGICAL UNIT SERVING AT A BRITISH BASE HOSPITAL, WITH THE END-RESULTS OF THE CASES ONE YEAR LATER.

By Channing C. Simmons, M.D., Boston,

Assistant Visiting Surgeon, Massachusetts General Hospital; Assistant in Surgery, Harvard Medical School.

The following is a report of the cases coming under my care at the 22d General Hospital during my service with the first Harvard Unit serving with the British Army in France. The service was short—from August 16 to October 2, 1915—practically seven weeks. As major I was responsible for five tent wards representing about one-third of the surgical cases. These wards held 139 beds which were increased towards the end of the service to 187, but at no time were they all filled. A medical officer, ranking as captain or lieutenant, was in charge of each ward and did the greater part of the routine work,—Drs. Bachman, Goodwin, Reardon, Steenberg and Stookey, and to them credit is due for any success the service may have had.

Although called a base hospital, we were not supposed to keep cases that had not a reasonable chance to recover in three or four weeks, consequently most of the interesting cases were sent to England after a few days' stay, depending on their condition and the demand for beds. The less seriously wounded remained in the hospital longest. During the Loos drive all cases, mild and severe, were sent to England as soon as they could be moved to make room. Cases were received at the hospital in from twelve hours to several days after injury, the average time being two to four days. Occasionally men wounded in the morning would arrive the same night. Cases received more than 48 hours after injury were usually serious and had been kept at the clearing station until in a proper condition to be moved. The impression was that a man, after he had once been removed from the field, received extremely good care and attention.

I have delayed publishing a report of the service till this time as I wished to determine the results in some of the more serious cases. The home address of all patients was obtained with this in view, and also the address of a relative or friend. Letters were sent November 1, 1916, a year after the injury, to 87 of the more seriously wounded, including all cases of compound fracture, all head, lung, and abdominal wounds, most of the cases that had had infection with the gas bacillus, and certain of the cases that had serious wounds of the soft parts. Replies have been received from 59. Few of the replies are of great scientific value, but all are extremely interesting, as the British Tommy is a prolific writer. With hardly an exception the men, although maimed for life, are happy and cheerful, and have even tried to enlist again and been refused. Certain of the figures given are not absolutely accurate but the errors are slight and relatively unimportant.

There were 310 patients admitted to my wards during the service, divided as follows:

Wounds	238
Civil injuries and diseases	45
Injuries, not wounds, due to military service	28

WOUNDS.

The wounds varied from the slightest scratch to severe multiple injuries, compound fractures, etc. During the September offensive about Loos practically every wound, no matter how trivial, was sent back to the Base Hospitals and it was not unusual at that time to have a patient admitted one day with, for instance, a slight abrasion of the scalp, and discharged the next. In the ordinary trench fighting the wounds were more serious, as slight injuries were attended to at the Clearing Hospitals. The wounds during this drive were chiefly bullet wounds, while those received in trench fighting were usually from fragments of high explosive shells. It is difficult to determine what type of missile caused a given wound, for although the patient has definite ideas on the subject, he often does not know. As far as can be determined, the wounds were as follows:

Rifle bullet	95
Shrapnel bullet	8
Shell casing	118
Hand or rifle grenade	17
Wounded by own grenades	2
Wounded by English bullets	2
Self-inflicted (?)	1

Wounds by Regions.

Head and face	46
Body (back)	41
Body (front)	19
Right upper extremity	35
Left upper extremity	62
Right lower extremity	40
Left lower extremity	35

The left upper extremity, including the shoulder, was more often the seat of injury than the head and face, although the steel helmet was not in use at this time. This part of the body is most often wounded as in trench fighting it is the most exposed, the left hand and arm protecting the face. Thus there were 17 wounds of the left hand and only four of the right. The wound was more often on the back than on the front of the body, due probably to the position of the men in the trenches. Fifty cases, 22%, presented multiple wounds. In 13 they were of one part of the body only, while in 37 they were widely scattered. Most of these were shell wounds, but some were caused by bullets, one man having rifle bullets in his foot, arm, and chest. A certain number had in-and out wounds of different portions of the body caused by the same bullet, as, for example, in-and-out wounds of the soft parts of both thighs, both buttocks, etc.

Severity. Some idea of the severity of the wounds may be obtained by the disposal of the case. Cases were discharged to Convalescent Camp, Base Detail, or to England (hospital ship). If sent to the Camp they remained there for a short time and then rejoined their commands, and no case requiring a dressing could be discharged in this manner. Discharged to Base Detail implied that the patient was considered fit for light duty. Cases sent to England were usually seriously wounded, but I have divided this last group into the severe and slight wounds, which under ordinary circumstances would have stayed in the hospital a short time and been discharged to the Convalescent Camp, but which during the Loos drive were sent to England at once to free the beds. This last and the first two groups would be able to return to their commands in a short time.

Discharges.

Convalescent camp	72
Base detail	12
Dead	3
Transferred medical	3
Sent to England	
severely wounded	70
slightly wounded	38
Remaining in wards	40

Thus in 122 cases, or 51%, the wounds were comparatively slight and the man returned to his command in a short time. A larger percentage than this returned to active service, as many seriously wounded and sent to England permanently recovered, and also all cases remaining in the wards at the end of the service are classed as permanently disabled, which they were not. It is interesting to note that of the 22 cases seriously wounded, from whom I had letters and who had returned to active service, 10 have been wounded again or killed.

OPERATIONS.

There were 113 operations done on the service, of which there are records in the operating room, but many minor ones were done in the wards. Of these, 29 were done by me and 84 by the medical officers. During the drive many minor cases were sent directly to England without having foreign bodies removed. The average case seen was one of minor surgery,—the removal of a foreign body, opening an abscess, etc. On the other hand, certain cases, brain and abdominal wounds, compound fractures, and cases with a gas bacillus infection, for example, are the most major surgery, and require the best judgment possible, only to be acquired by experience with that type of case.

There were two cases admitted, both shell wounds, that had had a traumatic amputation of the left hand. Two amputations were performed on the service, both for gas gangrene and both compound fractures. The English army surgeon is more inclined to amputate in compound fracture than the American, who is much more conservative. Whether or not in war times this had been proved to be the most efficient treatment and enables the man to become a wage-earner sooner, I do not know. My personal feeling is to save everything possible, and it was discouraging to learn that a limb, saved with difficulty, was amputated soon after the patient was transferred to England. Three cases of compound fracture that were doing well at the time of transfer, had the limb amputated later. From the letters received from these patients, describing their condition, I do not think an American surgeon would have considered amputation.

MORTALITY.

There was a mortality of three cases, but a fourth case, a fracture of the dorsal spine, was sent to England and probably died soon after. It is to be inferred from this that most of the serious cases were treated at the Clearing Hospitals, and that the mortally wounded usually die in a few days. It would also seem that any cases living 5 to 7 days have a very good chance of ultimate recovery.

Case 73. Shell wound. Compound fracture of skull, penetrating wound of lung with hemothorax, multiple wounds of back and right arm with gas bacillus infection. Died two days after admission. Autopsy.

Case 10. Shell wound of groin with division of the femoral artery. Patient moribund when admitted and died in a few hours of hemorrhage and shock.

Case 221. Shell wound of leg with compound fracture of fibula, bullet wound and compound fracture of humerus, pneumonia. Patient lay between the trenches in the rain for 36 hours before being brought in. Gas gangrene of leg. Amputation. Death three days later.

SEPSIS.

Most of the wounds were infected and practically all were treated as septic. This was particularly the case with the shell wounds. The fragments invariably carried in pieces of dirty clothing, and it was the rule to explore every case and remove the foreign body and, more important, the cloth. We found that in jagged shell wounds caused by a "side swipe" with a large fragment of shell and in which there was no penetration, time could be saved in healing by excising the sloughing edges and base of the wound, and doing a secondary suture. Something was always gained, although slight sepsis was to be expected. Bullet wounds were less apt to be followed by sepsis, and a certain number of both in-and-out and penetrating wounds remained clean and healed rapidly.

Infection with a bacillus of the gas-forming group is the thing to be dreaded, but the bacillus is not as virulent as the one commonly met with in this country. In some cases where a positive culture was obtained, there were no constitutional symptoms. Clinically, the short, thick forms appeared to be more virulent than the long, thin forms that at times appeared in chains. Credit should be given to Dr. F. R. Frazer for his careful bacteriological work under very adverse conditions. There were 25 cases of gas bacillus infection on the service, with two deaths, but in neither of these did the infection alone cause the fatal result. Full bacteriological reports were obtained in 15, while the other 10 cases were seen during the rush, and the diagnosis was only clinical or made from smears, but cannot be doubted. The wounds were caused by shell fragments in 12 cases and bullets in 13, but 10 of these latter were compound fractures. The appearance of the wounds was characteristic. The limb was swollen, the tissues necrotic and exuding a thin watery pus filled with fine air bubbles. The odor is unmistakable. But three of the cases presented subcutaneous emphysema. Probably the other cases were operated upon before it developed.

The cultures from the wounds resembled cultures from feces. I have more or less detailed reports of cultures from 35 wounds infected with gas bacillus that were made in the hospital. One is given which is typical of them all.

Case 87. Compound fracture fibula. Multiple wounds of both arms (shell).

Sept. 8. Smear, no organisms. Culture (agar), Gram-negative bacillus (colon?) and a Gram-positive bacillus resembling gas bacillus. Anaerobic agar, sterile. Anaerobic litmus milk, sterile.

Sept. 9. Smear, streptococci and Gram-positive and negative bacilli. Culture (agar) staphylococci and streptococci. Anaerobic agar, Gram-negative bacillus. Anaerobic litmus milk, acid, clotted, gas formation, and gas bacillus present.

Sept. 10. Second culture. Smear, diplococci. Culture (agar) streptococci. Anaerobic agar, sterile, 24 hours. Anaerobic litmus milk, acid, clotted, gas formation, and gas bacillus present.

For the determination of the presence of the gas bacillus only, Dr. Frazer made the culture in boiling milk. Bacteria, except the spores of the gas bacillus, were killed by the heat, but the spores of the gas bacillus withstood the temperature for the short time it took the milk to cool.

Cultures were taken from a series of 15 ordinary wounds when the patients were admitted. The wounds were cleaned, and healed the way slightly septic wounds ordinarily do. Three had, however, a pure culture of gas bacilli, although clinically they showed no signs of it. One case, a severe wound of the arm, complained a week after admission of soreness in a finger. Examination showed a shell fragment one-half inch in diameter which had been overlooked. It was removed and the wound healed promptly although culture showed a pure culture of gas bacillus.

Most wounds infected with the gas bacillus were thoroughly cleaned out, all dead tissue cut away, and packed wide open. Peroxide of hydrogen dressings were used or, when possible, a constant irrigation of hyperchlorous acid.

TETANUS.

There were no cases of tetanus, although the wounds were very dirty. As a routine, all cases were given anti-tetanic serum at the front, but occasionally a case was overlooked. On admission all cases were questioned as to whether they had received the serum, and if not it was immediately given. Eleven cases had more or less serum sickness coming on from five to twenty days after its administration. These varied from transient urticaria to severe prostration with high fever lasting three or four days. There were two cases of giant urticaria.

WOUNDS OF THE LUNG.

There were 11 cases of wounds of the lungs with one death (wound complicated by a compound fracture of the skull), and no cases of empyema. Four were caused by a rifle ball, one by a shrapnel ball, and six by shell fragments. Four, three rifle bullet and the shrapnel bullet wound, were in-and-out wounds, and in five a piece of shell was in the lung. Two cases were fracture of the lung without penetration. The cases reached the hospital in from one to five days after the injury, the average time being two and one-half days. Constitutional symptoms were comparatively slight in all and the temperature and pulse were only slightly elevated, returning to normal in a few days in all but one case. Cough was present only six times, the sputum being bloody in five cases and mucoid in one.

The physical signs were the same in eight of the cases. There was evidence of hemothorax above which was consolidated or compressed lung, but with a small area of normal respiration at the apex. Two cases, both with profuse bloody sputum, had no hemothorax at entrance, one and one and one-half days after injury. Examination showed coarse, moist râles only, but one case developed hemothorax five days later,—an in-and-out bullet wound. The other case, a fracture without penetration, never had an effusion.

No case developed empyema, although on account of the persistent temperature it was suspected in one. A tap revealed only bloody fluid, which clotted on being withdrawn. Culture was sterile. The case complicated by fractured skull died and an autopsy was obtained. The pleural cavity contained two litres of bloody fluid. The lung was collapsed and showed a few areas of consolidation. It was necessary to place the organ under the fluoroscope before the missile, a piece of casing one-fourth inch in diameter, could be found. Although no accurate analysis of the fluid was made, it appeared to be about one-third blood and two-thirds serum.

Two cases had wounds of other portions of the body, and one pneumonia of the unwounded lung.

The end-results are known in nine of the eleven cases. One died. Four of the other eight are back on active service and one has been wounded again. Two of these were fracture without penetration, and in two a shell fragment was in the lung. Only two of these men had a hemothorax and one of them has spit up blood twice since the injury and has some shortness of breath. The fifth case, an in-and-out bullet wound with hemothorax and subcutaneous emphysema, has no symptoms. He also had a bullet wound of both legs.

Two other cases are working at a base,—an in-and-out wound, and a shell wound. Both had a hemothorax and both now complain of some shortness of breath. One has had "pleurisy" within a few months, and the other says that a recent x-ray shows some consolidation.

The other two cases have been discharged as unfit for service. Both have shortness of breath and both say that a recent examination of the lung showed that it "was not normal." One, a miner, can work only three days a week.

ABDOMINAL WOUNDS.

There were only three cases of abdominal wounds, two of which had been operated upon at the Clearing Hospital and were convalescent when admitted. All recovered. In one the abdominal cavity had been opened in the groin by a large shell fragment. This man at present has no abdominal symptoms, but is incapacitated as he also had a traumatic amputation of the left hand. One case had multiple bullet wounds of the intestine, which had been sutured at the front. He also had a compound fracture of both bones of the forearm and pneumonia. In the third case a shrapnel ball had entered the buttocks. He was admitted 36 hours after injury with a history of suppression of urine for that length of time. X-ray showed the ball in the pelvis. Suprapubic cystotomy was done and the ball found loose in the bladder. There was considerable sloughing of tissues from extravasation of urine, but recovery was otherwise uneventful. The man reports a year later that for some time he had incontinence and occasionally passed blood but is now well. He has been working in a bank for the past four months.

SKULL AND SPINE.

Eight cases. There were six cases of fracture of the skull. Two were slight depressed fractures of the vertex without symptoms. The depression was elevated. Three had a compound fracture of the frontal bone, one of whom died. In the other two there was an extensive injury to the upper jaw and face with the loss of an eye. There were no cerebral symptoms in either. Both of these men have been heard from and both are now working. They sent me their photographs, and the cosmetic result is good considering the injury. It was necessary to do two plastic operations on one case.

The sixth case had a small piece of shell in the brain in the parietal region and a brain abscess. The fragment was removed and the abscess drained with the perforated metal tube suggested by Sargent. At discharge this patient was aphasic and had paresis of the face and arm. A letter from his mother states that he was in the hospital for some time, and several pieces of shell were removed from the scalp. His aphasia and paresis evidently cleared up as he was discharged to base duty, but recently he has lost his speech again.

Spine. Two cases. One case, now dead, had a fracture of the dorsal spine with complete paralysis (shrapnel ball). The other case had a fracture of the spinous processes of the first four dorsal vertebrae without symptoms. He is now on active service, but not in the trenches, as carrying a pack hurts his back.

PERIPHERAL NERVES.

There were but two cases of injury to the peripheral nerves recognized, one a paralysis of the recurrent laryngeal nerve following a wound of the neck, and the other a paralysis of the ulnar nerve in an extensive septic wound of the forearm. It was thought at the time that, owing to the hurry and the fact that most of our efforts were spent in combating sepsis, nerve injuries were overlooked, and this has proved to be the case. Five cases of compound fracture report by letter to have some nerve injury. In two of the six cases of fracture of the shaft of the humerus heard from, there is musculospiral paralysis. Both have been operated upon and in one, function has returned. The radial nerve was divided in two instances, but the disability is slight and both men are back on active service. There is one case of paralysis of the median and ulnar nerve in an extensively comminuted fracture of both bones of the forearm. This man has little use of his hand, but prefers it to an artificial one.

JAWS.

Contrary to the usual experience, there was a relatively small proportion of fractures of the jaws. There are only two cases, both upper jaws, and both complicated by fracture of the skull. Both have been heard from, and, considering the injury, the cosmetic results are good. Both are self-supporting.

COMPOUND FRACTURE.

A year ago I reported the compound fractures coming under my care (Boston Medical and Surgical Journal, Feb. 17, 1916) and will, therefore, consider only the results. There were 61 cases of compound fracture, or over 25% of all cases. Of these, 45 were of the long bones. Several points have been brought out by the letters.

Of the 45 cases, the end-results are known in 34. Two died. In thirteen of the cases from one to seven operations were done after their return to England for the removal of fragments of dead bone. Five cases had an injury to a peripheral nerve which was overlooked when the patient was under treatment in France, and two had had a plastic operation on the musculospiral nerve with one success. There was only one case of non-union. This was a patient with a fracture of both bones of the leg. This was plated, but the plate was later removed.

Three cases had an amputation performed after their transfer (see amputations). The cases are as follows:

Case 141. Sept. 26, 1915. Bullet wounds of the forearm, chest, and ankle, with fracture of a rib and the lower end of the tibia into the joint. Three bullets removed. Little comminution and no displacement of the fragments. The wounds of the arm and chest healed rapidly. After his return to England he had several operations for the removal

Compound Fractures.

Humerus	Total Cases	Cases Heard From	Other Operations	Results
Head	2	2		1 perfect, 1 dead (see fracture tibula).
Shaft	7	5	3	1 perfect, 4 with stiff elbow.
Lower end	3	3	1 Amputation	2 with musculospiral paralysis. 1 perfect (a crack only), 1 stiff elbow, 1 amputated in England.
Radius				
Head	1	1		stiff elbow.
Shaft	2	2		1 perfect, 1 amputation (gas gangrene).
Lower end	3	3		3 perfect.
Both Bones				
Forearm	3	2		1 perfect, 1 ulna and median paralysis.
Metacarpals	10	6	2	3 perfect, 3 some use of hand.
Femur	4	2	1	Both sinuses, 2 in. shortening. Walk with cane. (gas infection. A question of hip joint amputation in one case.)
Both Bones, Leg	2	1	1	Non-union.
Tibia	3	3	3	2 amputated in England, 1 has a sinus, but walks with cane.
Fibula	2	2		1 amputation for gas gangrene.—death 1 perfect.
Metatarsals	2	2	1	1 perfect, 1 walks with cane.

of fragments of dead bone about the ankle and the opening of abscesses. Leg amputated in February, 1916.

Case 218. Sept. 28, 1915. Compound, badly comminuted fracture of the lower end of the tibia, extending into the joint. Rifle bullet in head of astragalus. Bullet removed. After transfer had many operations for fragments of dead bone, but wound healed in the spring of 1916, leaving the ankle stiff. In October, 1916, another abscess formed, and the leg was amputated in November, 1916, over a year from the time of injury.

Case 225. Sept. 28, 1916. In-and-out bullet wound which practically destroyed the elbow joint. Gas bacillus infection. At discharge the wounds were granulating well and the motions of the hand were good. The arm was amputated ten days after his transfer to England.

JOINTS.

There was only one case of a wound of a joint other than those occurring in compound fractures, or of the carpus or tarsus. In this case a small shell fragment was removed from the knee joint 24 hours after injury. The joint was washed out with salt solution and closed without drainage. The joint remained clean, although the superficial wound was infected. The man is back on active service, but the knee swells at times after violent exercise.

WOUNDS OF THE SOFT PARTS.

The following is a brief analysis of the wounds of the soft parts. These figures, as others, are not absolutely accurate, as cases wounded in two places, as the arm and leg, have usually been counted twice, while others have already been considered under other headings.

Shell wounds (no foreign body)	69
Shell wounds (foreign body)	59
Bullet wounds (no foreign body)	50
Bullet wounds (foreign body)	8
Shrapnel ball	1

The shell wounds, where there was no foreign body, were usually cuts with large fragments of casing. The bullet wounds were usually in-and-out wounds, but some were gutter wounds.

Head and scalp. 25 cases (other than fractures). All slight wounds. Most were caused by shells bursting near the patient, and the fragments either peppering the scalp or making slight cuts. A few were gutter wounds, which cut the scalp without injuring the bone. It was in this type of wound that excision and secondary suture gave the best results. Some idea of the severity of the wounds may be had by studying the discharges. 23 of the 25 patients were sent to the Convalescent Camp, or to Base Detail, well. Two were sent to England, to give more beds.

Neck. 6 cases. Five shell and one in-and-out bullet wound. The wounds were all slight with one exception, a man with a small wound, recurrent laryngeal paralysis and pneumonia.

Body. Back 21, front 4. These were similar to all wounds of the soft parts, and the chief interest lies in the frequency with which the wound was on the back. The buttocks were proportionately commonly wounded,—6 cases. Most of the wounds were slight, 19 of the cases being well or practically so when last seen. Four were severe, one having a shrapnel ball pass through the back from the left shoulder to the right kidney, where it lodged without causing damage. Another case had a gas bacillus infection involving the ischio-rectal fossa.

Shoulder. 20 cases, 13 shell wounds and 7 bullet wounds. Of the latter, 4 were in-and-out wounds and 1 was a gutter wound. All were slight flesh wounds. In one case a shell fragment entered under the acromial end of the clavicle and was found, with the x-ray, in the mediastinum. Although it is difficult to see how the lung escaped injury, there were no symptoms referable to that organ. The man is now, one year later, on active service.

Arm. 19 cases, 12 bullet and 7 shell wounds. 7 were multiple. There were 3 moderately severe wounds, 1 being infected by a gas bacillus. This man, however, returned to active service, and has since been wounded again. I believe all the cases returned to active service.

Forearm. 19 cases, 9 bullet and 10 shell wounds. In the 9 bullet wounds, 8 were in-and-out or abrasions only, while in the other the bullet lodged against the ulna without fracturing it. In 7 of the shell wounds fragments were removed.

Hand. 15 cases, 2 bullet and 13 shell wounds. In two of the latter, only, was it necessary to remove a foreign body. The wounds were often severe as regards permanent disability, as several had one or more tendons severed or joints opened. One man had the tendons of the four fingers severed. Tendon suture was done 48 hours after the injury was received, and, although the wounds went septic, he writes a year later he has perfect use of his hand and is still in the service, but stationed at a base.

Thigh. 25 cases, 12 bullet and 13 shell wounds. Many of the bullet wounds were in-and-out, while in 11 of the shell wounds it was necessary to remove foreign bodies. Three wounds were infected by a gas bacillus.

Leg. 20 cases, 12 shell and 8 bullet wounds, of which 7 were in-and-out. Four of the wounds were severe.

Foot. 5 cases. All slight wounds, but the disability was relatively great. All would eventually permanently recover.

Burns. 2 cases. Both were of the face and hands, and were superficial. One was caused by the premature explosion of an English fire bomb, and the other by the explosion of a German grenade from which the man was attempting to make a souvenir.

INJURIES DUE TO SERVICE.

Twenty-eight cases. The injuries in this group, although not properly wounds, were due directly or indirectly to military service. There were 6 cases of fracture, 8 of minor sepsis, and 14 of sprains, etc.

Six of the cases, three fractures, were caused by horses or mules, and one, a fracture of both bones of the leg, by an automobile. Six cases were injured by being buried in earth or sand bags by the explosion of a shell. Most of these were minor injuries, but two were severe sacro-iliac strain. Several of these "buried cases" presented a peculiar mental condition, best described as having "lost their nerve," although the injury was comparatively slight.

The other injuries were caused by falling into shell holes, falling over a trench, entrenching, etc.

There were eight cases of minor sepsis, all trivial, several due to the conditions under which the men lived in the trenches.

Fractures	Metacarpal, rib, clavicle, nose, fibula, both bones of leg.	
Minor sepsis	Eight cases.	
Sprains, etc.	Sprained ankle	3
	Synovitis knee	3
	Dislocated semilunar cartilage	1
	Abrasions	3
	Sacro-iliac strain	3
	Tuberculosis hip	1

CASES OF CIVIL SURGERY.

Forty-five cases.

There were five cases of sprains or fracture, three being due to football; and two, dislocated semilunar cartilages of the knee, had had trouble for years, and should never have been accepted in the army.

Minor sepsis. Many of these, such as four cases of multiple boils, were probably due to the conditions in the trenches.

Abdominal cases. Eleven cases. There were two cases of appendicitis, one of an abdominal sinus following appendectomy eight years before, and eight cases of hernia. Hernia is common. Three of the cases, two inguinal and one ventral, had been operated upon previously, and were recurrent. One case had had a hernia for years, which had not bothered him until he entered the army one month before. This man also had thrombosis of the opththalmic vein, and should not have been passed by the examining surgeon. Three cases of hernia were operated upon and five were not. It is impossible to force a man to be operated upon if he does not wish it, and all patients have to be given the choice of a truss or an operation. A certain number choose a truss, as it means they will not be called upon to do active work, but be put at clerical work at the base.

Genito-urinary diseases. Five cases. There were two cases of acute epididymitis, one of syphilis, one of phimosis, and one of varicocele. Venereal diseases were uncommon, owing partly to the fact that they were all sent to a special venereal hospital.

Medical cases. Three medical cases were admitted to the wards,—a case of malaria, contracted in India, a case of diabetes, and one of pulmonary tuberculosis. These cases were transferred to the medical service. Several other cases that presented wounds were transferred to other departments, such as the dental, ear, or nose and throat, after the wounds had healed.

Varicose veins (3 cases). *Hemorrhoids* (10 cases). The three cases of varicose veins were not severe, and two I am inclined to think exaggerated the symptoms in order to get a rest. The hemorrhoid cases were probably due to the conditions in the trenches, and constipation, which was almost universal. Five were cases of many years' duration which had recurred, and five had had no trouble until they had been on active service. Six were operated upon and four refused, probably for the same reason the herniae refused,—they knew they would be put to work at the base and not be sent back to the front.

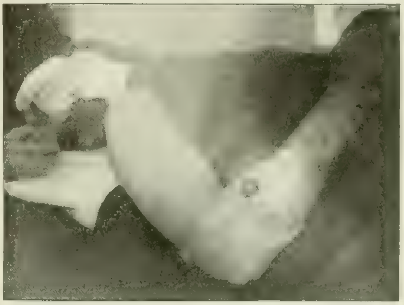

Fig. 1. Case 28. Compound fracture of the radius and division of the brachial artery at the bend of the elbow with gas bacillus infection. The arm is much swollen as far as the shoulder.

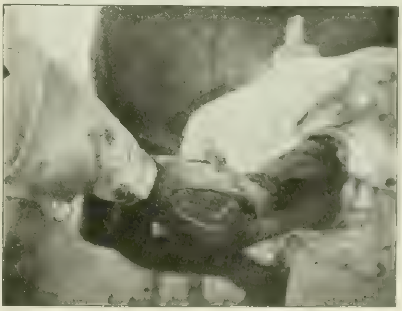

Fig. 2. Case 28 after operation. (See Fig. 1.) Multiple incisions have been made in the arm and forearm, and [illegible] with hydrogen peroxide, passed from one wound to the other. Amputation was performed the following [illegible]. The man is now well but almost destitute as he is unable to obtain work.

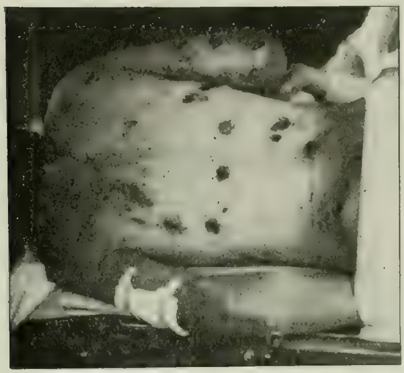

FIG. 3. Case 77. Multiple shell wounds of the back and compound fracture of the right humerus, with gas bacillus infection of all wounds. Foreign bodies removed and wounds drained. A year later patient reports that he has a useful arm but with some deformity. He is at present serving as an army cook.

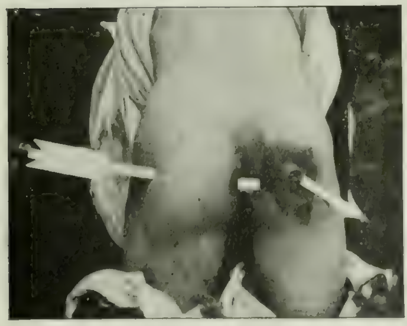

FIG. 4. Case 27. In-and-out wound of both buttocks, the arrow indicating the course of the bullet. The wound of entrance is hardly visible while the second wound of exit is quite large. The discoloration of the skin is due to iodine.

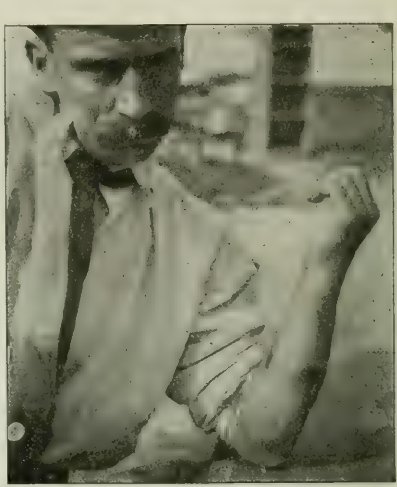

FIG. 5. Case 31. In-and-out wound of the forearm four days old. No disability. This man was discharged well five days later.

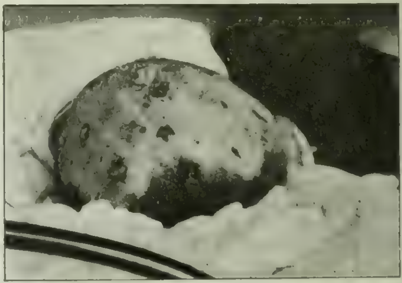

FIG. 6. Case 48. Multiple shell wounds of scalp with one fragment in the brain and brain abscess. Fragment removed and abscess drained with Sargent perforated metal tube. At discharge patient has a small brain hernia and paresis of the hand and face. A year later his mother wrote that he had been doing some work around a camp, but that he had recently lost his speech.

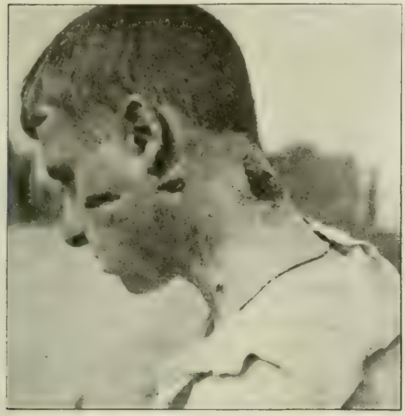

Fig. 7. Case 41. In-and-out, in-and-out wound of the face, made by a bullet. Note the comparatively small wound of entrance and large wound of exit. A salivary fistula persisted for some time, but the wounds were all healed in four weeks.

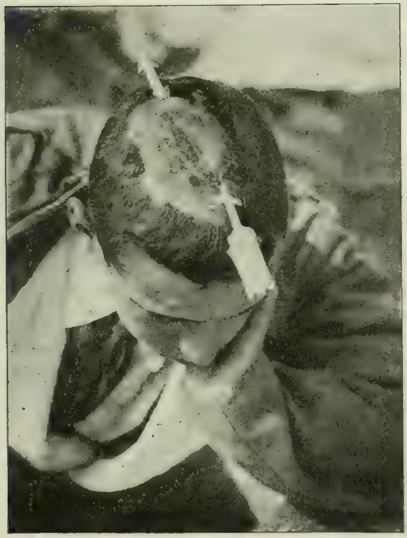

Fig. 8. Case 32. Gutter bullet wound of the scalp without injury to the skull. The arrow indicates direction of the bullet. Excision of wound with secondary suture followed by rapid healing. This man was killed later by the explosion of a German mine.

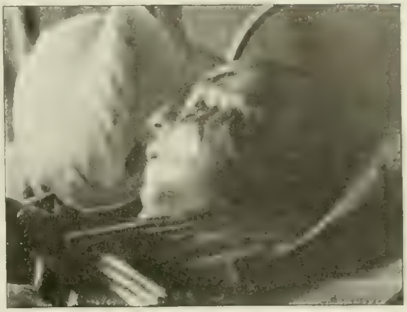

Fig. 9. Case 86. Compound fracture of the frontal bone and upper jaw with destruction of the eye. The wound extended into the mouth. No cerebral symptoms. A plastic operation to repair the cheek was done.

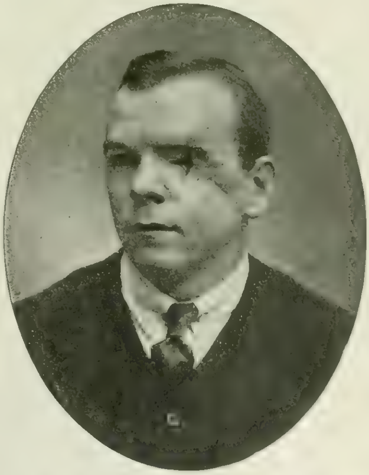

Fig. 10. Case 86. (See Fig. 9.) One year after injury. Two plastic operations were done after the patient returned to England. The man is working as a gardener.

ASCENDING LYMPHOGENOUS RENAL INFECTION.*

By Daniel N. Eisendrath, A.B., M.D., Chicago,
and
Oscar T. Schultz, A.B., M.D., Chicago.

[From the Morris Institute for Medical Research of the Michael Reese Hospital.]

We have attempted to study the route of infection of the kidney which takes place in an ascending direction along the interstitial lymphatics of the ureter. A preliminary report of our work was published early in the present year[1] and the complete results of our experiments will be published shortly.[2]

We have felt for some time that the older view of infections ascending from the bladder to the kidneys along the lumen of the ureter must be abandoned, except in cases of complete obstruction of the ureters. The work of Sakata, Bauereisen, and Kumita has shown that there is a direct and very intimate connection between the lymphatics of the bladder and those of the ureter and of the latter with those of the renal pelvis and kidney parenchyma. The work of Kumita especially has demonstrated the presence of a network of lymphatics in close relation to the blood vessels within the kidney. This network within the kidney communicates again with the lymphatics of the fatty capsule of the kidney (Fig. 1). In all previous experiments the ureter was either ligated and the organism injected above the point of ligation or the ureter was severed and reimplanted into the intestine. We believe that the ligation method produces a complete obstruction seldom found clinically, while the objection to the reimplantation method

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* Read at a meeting of the New England Branch of the American Urological Association, Nov. 28, 1916.

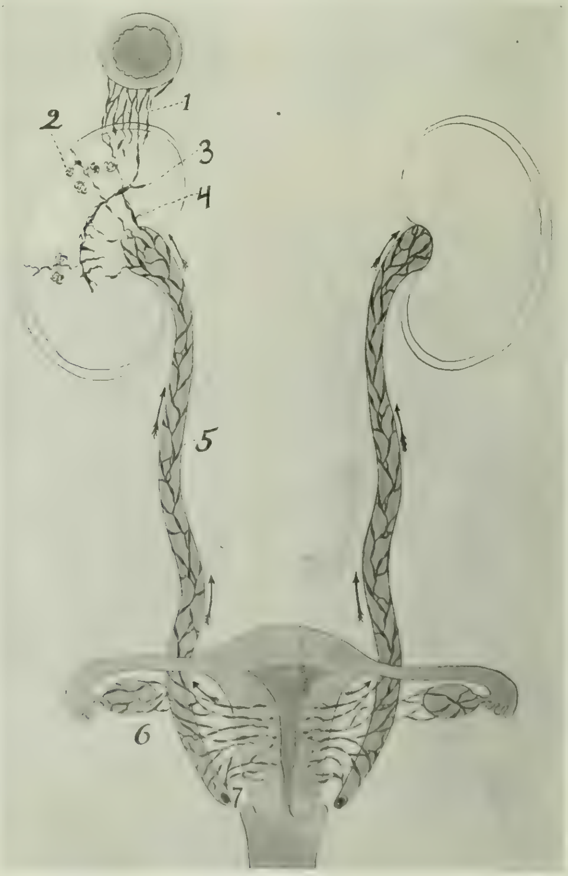

Fig. 1.

is that the action of the ureteral sphincter is nullified, and that the opportunity for entrance of organisms into the lymphatics of the cut ends of the ureters allows pathologic changes to occur with such intensity that it is difficult to trace the paths of the infection.

Technic.

The organisms employed were Bacillus coli, Staphylococcus aureus and Bacillus proteus. We attempted to imitate conditions found clinically in cases of ascending renal infection in the human being, by making an emulsion of sterile salt solution and scrapings of four agar slant cultures of the organisms. This emulsion was then injected into the bladders of female animals (dogs and rabbits) through a sterile silver cannula of very narrow caliber. The external genitalia were first thoroughly cleansed and some of the urine obtained for cultures so as to determine whether any infection was present before the emulsion of the bacteria was injected. The animals having been anaesthetized with ether, every precaution was taken to avoid any injury to the mucosa of the bladder and urethra. A minimum degree of force was used in injecting the emulsion.

Our animals were killed at varying intervals with strychnine and cultures were immediately made from the heart's blood, from both kidneys and from the bladder. For microscopic study the urinary tract with the surrounding connective tissue was removed *en masse.* Areas from different portions of the bladder were first taken, then the entire ureter was divided into segments. The lowest segment included the uretero-vesical junction and the highest, the junction of the ureter and renal pelvis. Between these two, the ureter was divided into four segments.

The kidney sections were taken so as to include in one set the areas where the finer divisions of the renal pelvis receive the papillae and in another set as much as possible of the medulla and cortex in a single section. All tissues were imbedded in paraffin, cut serially and stained with hematoxylin and eosin. The various segments of the ureters were cut longitudinally in serial sections, so that one could follow the paths of the infection continuously from the bladder upward into the ureter and along the walls of this structure into the parenchyma of the kidney. We cannot emphasize too strongly the great value of longitudinal serial sections in following the evidences of infection along the lymphatics of the ureter.

In two series of experiments carried out according to this technic, just outlined, a total of thirty-seven animals were used. Of these, eleven were rabbits and twenty-six were dogs. Of the eleven rabbits, six showed involvement of the ureter, five of the pelvis, and six of the kidney. The pathogenic organism injected was recovered from the bladder five times; from the kidney twice.

Of the twenty-six dogs used, twenty-one showed ureteral involvement, sixteen pelvic involvement, and thirteen, lesions of the kidney. The organism injected was recovered from the bladder twelve times and from the kidney five times. Seven dogs were examined by the same method as controls. One of these showed the same type of lesion in the ureter and pelvis.

Microscopic Changes.

Five days after the introduction of the bacteria into the bladder the urinary tract is the seat of a well-marked sub-acute inflammatory reaction, which is chiefly infiltrative in character. The change is most marked in the sub-epithelial tissues of the lower end of the ureter, especially about the mouth of the latter, and in the tissues of the pelvis. At these situations the stroma is decidedly infiltrated with lymphocytes, the endothelium of the lymphatics is swollen and there are numerous foci of perivascular infiltration. The mucosa of the bladder is decidedly infiltrated and in the mucosa and sub-mucosa the lymphocytes are congregated about the vessels. The ureter, between its lower and upper ends, where the reaction is most pronounced, shows moderate paths of lymphoid infiltration of the stroma, epithelium and muscle with some perivascular localization. The same reaction is present in the interstitial stroma of the kidneys leading to the formation of lines or band-like areas of cellular infiltration. The epithelium of the entire tract is intact, except in a few places where it has been invaded by the lymphoid infiltration.

Examination of the serial sections of these areas shows that these foci are largest in the sub-epithelial tissue, indicating that they had their origin here and only secondarily invaded the deeper portion of the epithelial layer. The experiments of longer duration, as compared with the five-day experiments, show those progressive changes in the inflammatory reaction that are to be expected. The sub-epithelial stroma is proliferated throughout the urinary tract from the bladder to the renal pelvis. The older series are more proliferated than in the fifteen-day experiments. New blood vessels are present and the lymphatic endothelium is proliferated. The focal lymphoid infiltration may be present in the bladder mucosa, in the sub-epithelial tissues of the ureter and pelvis. In the pelvis the infiltration may be diffuse as well as focal. The lymphoid infiltration is most marked at the mouth of the ureter and in the pelvis along the middle third of the ureter there may be, scattered, small foci of perivascular infiltration in the tissues of the outer zone of the ureteral wall.

Comparison of the changes due to the three species of the bacterial organisms used shows in the dogs the most marked reaction after B. coli and the least marked after Staphylococcus aureus, with after B. proteus a reaction intermediate between the other two. The findings are at variance with the usual statement that a pyogenic infection produces a most intense localization.

In the rabbits the same virulent reactions were obtained after B. coli and B. proteus as well as staphylococcus. In the dogs in every case the reaction is characterized by the absence of polymorphonuclear leucocytosis; by diffuse or focal lymphoid infiltration in the early stage, of variable degree, depending upon the organisms; and by moderate proliferation of the subepithelial stroma and of the capillaries in the later stages. Always, even when the changes are slight, the endothelium of the lymphatics reacts by swelling and proliferation, which may continue to such a degree that individual lymphatics may become completely filled with large, irregular polyhedral cells. Common to all the experiments is the intact condition of the lining epithelium of the entire tract. In every case the uretero-vesical and the uretero-pelvic junctions show a greater degree of inflammatory reaction than does the rest of the tract.

DISCUSSION OF CLINICAL APPLICATIONS.

Our work shows that both motile and nonmotile organisms are easily transported from the bladder to the kidneys by the lymphatic stream in the ureteral wall. This is not dependent upon the presence of any obstruction of the lower urinary tract, and it occurs even with intact uretero-vesical orifices. This would explain many of the cases of pyelitis and pyelonephritis which complicate a cystitis. When fever and chills occur during the course of an infection of the lower urinary tract, it is now generally accepted that this indicates an infection of the upper urinary tract, a pyelonephritis. Our experiments prove conclusively, we believe, that the path along which this infection travels is first in the bladder in the submucous and perivesical lymphatics, then by way of the lymphatics of the ureter (especially the submucous and peri-ureteral) to the submucous lymphatic vessels of the renal pelvis, and from here by continuity of the lymphatics directly into the network of intrarenal lymphatics, and then beyond this, into the perinephritic tissues (through the communication of the lymphatics of the cortex with those of the true and fatty capsule of the kidney).

Although difficult to prove experimentally, we believe that our work shows that the free anastomosis between the lymphatics of the broad ligament and those of the ureter makes it possible for infection to travel directly from the uterus and adnexa to the ureter, and from here to the renal pelvis of the kidney.

The intensity of the pyelitis in some of our dogs was out of all proportion to the ureteral changes. We believe that the same occurs clinically, and is explained by the slowing up of the lymphatic stream just before it communicates with the lymphatic current within the kidney. We have observed the gradual lessening of the intensity of the reaction the longer the animals lived. This is due to the immunization of the animal toward further infection, unless the intra-vesical inoculation is constantly repeated. The same phenomenon is observed clinically. As the infection in the bladder decreases, the pyelitis improves in equal ratio. This explains why bladder irrigations and supra-pubic or perineal drainage cause a rapid improvement in conditions of urinary sepsis, especially in infected kidneys.

CONCLUSIONS.

1. Anatomical studies have demonstrated the presence of an anastomosing network of lymphatics in the wall of the bladder and of the ureter, communicating above with a similar lymphatic network in the renal pelvis and parenchyma. At its lower end this system communicates also with the lymphatics of the pelvic structures, in both the male and female.

2. Infections of the bladder or lower ureter may reach the renal pelvis or the kidney, either by way of the lumen of the urinary tract or by way of the mural lymphatics.

3. Experimental and clinical evidence indicates that almost complete obstruction to the free passage of urine is necessary for ascent of infection by way of the lumen of the urinary tract.

4. Experimentally we have shown that infection, set up by the simple introduction of bacteria into the bladder without injury or without obstruction, may pass upward by means of the interstitial lymphatics of the ureter.

5. The degree of involvement following the introduction of bacteria into the bladder depends upon the virulence of the organism and upon the susceptibility of the animal. The subsequent tissue reaction may remain limited to the bladder and ureter, it may pass upward to the tissues of the renal pelvis, or even the parenchyma of the kidney itself may become involved.

6. When the kidney tissue is involved in ascending infection brought about experimentally, as described, the path of travel is from the subepithelial tissues of the pelvis to the kidney by way of the inter-tubular and perivascular lymphatics.

7. From the kidney the perirenal tissues may become involved through the capsular lymphatics, which anastomose with those of the cortex.

8. The experimental evidence indicates that, in cases of pyelitis and pyelonephritis in the human, secondary to infection of the bladder, the lymphatics constitute the most important course of upward travel of the infection, especially in those cases where there is no hindrance to the urinary outflow.

9. Pyelitis and pyelonephritis, not secondary

to cystitis, may also be the result of lymphatic transport of infection from the pelvic organs in the male and female, and from the lower intestinal tract.

REFERENCES.

[1] Jour. A. M. A., Vol. lxvi, February, 1916.
[2] Jour. A. M. A., Vol. lxviii, p. 540, February 17, 1917, and Jour. Med. Research, Vol. xxxv, January, 1917.

DISCUSSION.

Dr. Hugh Cabot: This paper raises a very interesting group of questions which are important. I want to thank Dr. Eisendrath for giving us ample opportunity for going over his material in advance. It is certainly in that way that one gets down to the facts, where you can take a man's work and go over it at your leisure. When any one of us puts out work which is at variance with the work of previous observers he will not object to confirmation.

Dr. Eisendrath's method of producing all these infections is by the injection of organisms into the untraumatized bladder. That is a type of experimental work which has been done for years. There is an immense mass of evidence showing that infection of the bladder and the urinary tract cannot be produced by that method, and I submit that there is an inherent possibility of error at this point. There is clinical and an immense mass of experimental evidence tending to show that by the introduction of organisms into the bladder in the absence of obstruction, whether produced experimentally or existing pathologically, no infection has ever been demonstrated to take place, and I think it is certainly necessary that this work be confirmed and that evidence be produced by other experimenters that it is possible to produce inflammatory lesions of the urinary tract without the production either of trauma or obstruction.

In the production of an inflammatory lesion of the urinary tract such that the lesion can be demonstrated and in which the organisms are recovered from the urine at autopsy, it is necessary to show that in the cases where the organisms are recovered there shall be a lesion in that patient. For example, in Case 401, a dog infected with the colon bacillus, there were no lesions and yet the organism was recovered from the bladder. That is a case that requires explanation. Take also Case 429, a dog with the bacillus proteus. There were lesions in the ureter, pelvis and kidney, and no culture. In one case there are lesions and no growth, and in the other, growth and no lesions. Again, the length of time over which these organisms appear to be recoverable seems to me quite extraordinary.

It is acknowledged that the chronic colon bacillus lesion of the kidney is a pyelitis which connects with the urinary tract. That is the lesion typical of pyelitis and has been so recognized for years. The organisms persist because they grow in the urinary tract, either in the mucous membrane or, in the presence of obstruction, in the urine itself. The characteristic thing about Dr. Eisendrath's lesions is that they are not in contact with the urinary stream and we should not expect to find organisms in culture in the urine.

It is interesting, I think, to trace the cause, the natural history, as one might say, of a case of pyelitis. The early cases have been difficult to find. There is very little pathological material other than experimental material showing the exact nature of the colon bacillus infection, which later may terminate fatally. Now those specimens, as far as I have known of them, have universally shown a pyelitis-demonstrated by the organism in the mucous membrane and in infiltration of the mucous membrane, the process having settled there because that is a satisfactory medium for it, whereas the kidney itself is not a satisfactory medium. The organisms enter the kidney from above and infect it. They do not find a location favorable for growth and ultimately arrive at the mucous membrane and do find there a congenial condition, so there they remain. That is, as I believe, the typical cause of colon bacillus pyelitis.

Dr. Eisendrath says that this work shows the transference of organisms from the bladder up along the ureter to the kidney. I submit that no transference is shown. Perhaps he has slides which show organisms, but if so we have not seen them. It seems to me absolutely essential that if it is to be claimed, as he claims, that he has demonstrated the transference through the bladder to the kidney, the organism would be somewhere along the road. Organisms in these lesions must be shown if we are to believe that the organism and the lesion are fastened together.

I understood him to correlate the occurrence of fever and chills in a case of acute pyelitis subsequent to a cystitis with the passage of the organism along the lymphatics. One might suggest that fever and chills are commonly produced by the entrance of organisms into the blood stream, and the colon bacillus has been found in the circulation with great regularity. It is not safe to assume that fever and chills occurring in pyelitis are due to lymphatic infection. They certainly may reach the kidney through the blood stream.

Again, I think one does well to remember that the lymphatic systems of the ureter are exceedingly segmented. There is nothing, as far as I know, approaching a continuous chain of lymphatics for any considerable distance. They leave the region of the ureter and go to the lymph nodes. They must return back along the lymphatics from the nodes to the ureter. It is not a continuous performance, by any means. We must be prepared to assume that they leave the ureter and then see fit to return to the ureter in preference to staying where they are.

Again, we should do well to remember that where, as is shown here, there are areas of definite infiltration about the blood vessels, it does not follow that those are lesions of the lymphatics. We know, in fact, that lesions of the vein will produce that appearance about the vein involved, and that a perivascular infiltration does not by any means show it to be lymphatic and in some cases clearly does show it to be vascular in origin. Undoubtedly organisms leave the vein and reach the lymphatic, and *vice versa*, once having been in a lymphatic, very readily enter blood vessels. It may be readily interrupted at any point in its progress by direct entrance into the vein.

Then finally (and I trespass here slightly on the ground which Dr. Crabtree will cover), lymphatic infiltration is not characteristic of any inflammation known to be produced by the Staphylococcus aureus. It is quite at variance with human microscopic pathology, and is evidence of a chronic and not of an acute lesion.

We must hold that this is an interesting piece of work, that though it shows lesions in the periureteral, peri-vesical and peri-pelvic structures, there is a lack of evidence showing how these lesions are produced, and it has not been demonstrated that these lesions bear any relation to the bladder.

DR. E. GRANVILLE CRABTREE: Dr. Eisendrath very kindly brought on with him the pathological material on which this paper is based and left it with Dr. Cabot and myself over the period of the Yale-Harvard game. I have had an opportunity both to read the paper which you have just heard and to go over carefully the pathological material at my leisure.

The material is most interesting. Areas, such as you have seen pictured, of undoubtedly inflammatory nature are found beneath the pelvic mucosa and along the ureter. The infiltrations are almost invariably lymphocytic with, in some cases, a few leucocytes. The areas of infiltration are small with a striking absence of renal lesions of significance. I have failed to find any difference in the character of the lesion produced (pus cell or lymphocyte) when the lesion represents infections of 5-7 days—or that of many weeks. One must then believe that acute coccus infections produce what we must classify pathologically as chronic inflammation.

There are several facts which come to mind which require explanation before the theory of lymphatic infection of these kidneys can be accepted.

One of these points is, that inasmuch as you have to deal with lymph channels, when pus-producing organisms are used as infecting agents, suppurative changes of the regional glands are to be expected. Dr. Eisendrath does not mention whether or not he has noted it. Perhaps these changes exist and have not been noted.

That the Staphylococcus aureus in cases of recent infection produces the chronic type of inflammation in lymphogenous infections is possible, but pus cell changes in hematogenous infections is an inconsistency demanding explanation. That, it seems to me, is a condition which does not approximate the human kidney, which is the lesion we are endeavoring to explain.

Lymphatic involvement of the perivascular tissue, perineum and peritoneum has been shown by many observers to result *quickly* in blood invasion. I do not believe the cultural evidence here presented excludes the blood stream.

Dr. Cabot has brought out a point which is paramount, *i. e.*, the demonstration of relation to the lesions here shown of the organism injected. I refer to staining of bacteria in the tissues.

There is still another point which I wish to mention, which has already been discussed by Dr. Cabot. That is, the absence of evidence of invasion of the urinary stream by the organism. There is some evidence produced to indicate the occurrence of small chronic inflammatory processes invading the mucosa, yet neither from a general involvement of the pelvic and ureteral mucosa, nor from the urine, is there evidence of a lesion similar to pyelitis in the human. This may explain the rather erratic cultural returns from kidney, ureter and bladder.

This work is noteworthy in that it has added one more gravestone to the ascending urogenous theory—a once popular and pernicious theory.

Dr. Eisendrath's work shows possibilities which, I think, can be developed. He has already determined to stop some of the leaks by further work. If the lymphatics are capable of causing renal infection, work along this line will be able to prove it.

We have spoken thus freely, not to appear inhospitable, but because Dr. Eisendrath asked us for a frank criticism of his work.

DR. JOHN CUNNINGHAM, JR.: I wish only to congratulate Dr. Eisendrath on the excellent piece of work he has done and thank him for bringing it to us for discussion. From the diversion of opinion expressed by others who have given special study to this subject it seems that all that the rest of us can do is to sit as a sort of jury and listen to the discussion of the subject by the two factions.

DR. G. G. SMITH: It seems to me that Dr. Eisendrath's paper does suggest the explanation of certain things which we see occur clinically. For instance, I remember a man who had a seminal vesiculitis in which the Bacillus mucosus capsulatus was the etiological factor, and during the course of treatment for that he developed a kidney infection on the same side. I catheterized his ureter to see what was happening, and I found the same organism coming from the kidney.

Of course, it may have been simply a coincidence. Things like that are unexplained by theory, but if Dr. Eisendrath can put his case on four legs so that it will run, I think that it will explain some of those things which, to my mind, have hitherto been unaccounted for.

DR. A. L. CHUTE: Dr. Eisendrath has given us the opportunity of listening to a very entertaining and suggestive paper. I agree with Dr. Smith that some such method of infection as the author has described will explain certain cases that we encounter, better than any other method of infection.

In regard to the question that has been brought up, as to whether or not an infection can travel along the lymphatics of the ureter, I had supposed that this point was pretty well settled some years ago by the work of Stewart and Sweet. It is true that in their experiments the infection entered the lymphatics through the cut end of the ureter and not through the mucous membrane of the bladder, as in Dr. Eisendrath's experiments, but I thought their work proved definitely that an infection could extend up the lymphatics of the ureter. In women, especially, there are infections that do not bear the imprint of the hematogenous infection; there are one-sided renal infections that follow infection of the bladder quite promptly. The element of back pressure is so very slight in women as to make it improbable that these infections are up the lumen of the ureter, though it would be useless to deny the possibility of this. The only other probable methods are by the organisms getting through the bladder mucosa either into the blood stream or into the lymphatics, and one-sided infection is too frequent in such cases to make it seem probable that the infection is always by the blood stream. The importance of the blood-borne infections of the kidney, I think we have all recognized and appreciated for a considerable number of years, but to the minds of many of us it does not satisfactorily account for all renal infections.

I want to thank Dr. Eisendrath for my pleasure in his paper.

DR. EISENDRATH (closing): I certainly thank the gentlemen very much for what they have said. I want to tell you the circumstances under which I am reading this paper here. When we put out our preliminary report it was very brief. It appeared last January in the *Journal of the American Medical Association,* and at that time Dr. Cabot referred to the article and I wrote him about showing him some of my specimens. It is my experience that the only way you can get ahead is to present your argument, and that is the reason I left my specimens at the disposal purposely of Dr. Cabot and Dr. Crabtree in order that they should look at them and have a full opportunity, without being influenced by my presence, of judging for themselves.

They have pointed out some weak points. One of them is that we have not examined the regional lymph nodes, but personally I do not think that is as weak a point as it seems. I do not agree with Dr. Cabot and Dr. Crabtree in saying that the lymphatics are segmental. We know, for instance, that in the case of the common duct or of the cystic duct there is quite a long tube without any intercepting lymph nodes, though there are some at the neck of the gall-bladder and around the junction of the cystic ducts. Another reason why I do not think so is that in examining hundreds of sections we can find in these sections, layer by layer, from the bladder all the way up into the ureter, the areas of infiltration continuous. There is not a single interruption. There is not a single place, in looking at all the sections, of a segment of the ureter. Where you see any infiltration, that would indicate an extension from this sub-mucosa layer out in the peri-ureteral sheath. We are going to repeat a great many of our experiments, and we shall pay particular attention to the lymph nodes.

In regard to the question of lymphatic tissue, our attention was called very early to that by Dr. D. J. Davis, professor of pathology in the University of Illinois. He saw one or two of the sections and marked such areas with a question mark. I called it infiltration and submitted them to him, and he said "No. I think it is normal lymph nodule"; but ever since then we have guarded against judging anything of that kind. They have such a definite anatomical arrangement that they do not look in the least bit like those of lymphocytic infiltration.

In regard to lymphocytic infiltration, that might seem at first glance like a weak point. Yet we did not try to produce infections which would be so diffuse. In cases where we produced infections such as Stewart and Sweet did in their reimplanting they were so diffuse that it was hard to get such pictures as we have. I have had experience with them, and you cannot tell where an infection really started. That was why we tried to work with the organisms and really study the early stages.

I am not enough of a pathologist to be able to say that in the animals the lymphocytic infiltration is characteristic of sub-acute or chronic inflammation as compared to acute, but I am assured by those who are competent that this infiltration does not contradict the possibility of a sub-acute or low-grade infiltration.

Dr. Cabot mentioned the fact of no infection taking place through an intact bladder. Between the epithelial cells of the mucous membrane of the stomach there is a most intact network of lymphatics that runs around between the individual cells of the stomach. When we see such pictures in so many sections we begin to be greatly influenced to assume that infection takes place through this. We know that, for instance, organisms in the mouth will attack an intact mucous membrane and drain into the region of the lymph nodes.

Now, he showed some apparently weak points in my case 101, 15-day experiment, not finding any microscopical indication and yet finding it in the bladder. There seems to be the same thing in the animals that takes place in the human, that is, there seem to be animals which you are not able to infect. There may be a special immunizing process in these animals. The older the animal was the less changes we saw, because the animals would seem to have this immunizing process and would show less reaction.

Dr. Cabot made the statement that the colon bacillus finds a congenial medium for its growth in the pelvis of the kidney and therefore it lodges there. That colon bacillus has to go through the tubules of the kidney. It is supposed to destroy the convoluted tubules and lodge down in the mucous membrane of the pelvis and find a nice place to lodge there. Does that seem rational? When you have as strong a stream as a urinary stream, drop by drop, is there chance for it to find a long enough time to lodge there? It seems to me rational to think that in these cases of ascending infection they go to the lymphatics and that they grow there lying underneath the mucous membrane and then wander through the epithelial cells into the pelvis. It seems to me that of the two mine seems mechanically the more reasonable proposition.

In regard to stains for the micro-organism, we tried very few stains and our technic was faulty, but Dr. Crabtree and Dr. William H. Smith showed me a beautiful method for staining, and we are going to apply it in our future experiments.

The question that Dr. Crabtree also mentioned, that the kidney was seldom involved, does not quite hold water. Out of our total of 11 rabbits there were 6 kidneys which showed changes, and from our total of 26 dogs there were 13 showing changes. That seems a pretty fair proportion, considering that we purposely did not want to produce virulent lesions, and yet in those we found cases where, with the ureter almost completely destroyed, there were changes in the kidney. I want to thank you all for allowing me to present this to you, and for your frank discussion, and I hope to be able to report progress. I am personally convinced that it explains the cases of pyelitis of pregnancy and puerperium and the pyelitis of children better than anything I know of.

Society Report.

MEETING OF NEW ENGLAND BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION.

Harvard Club, Boston, Nov. 28, 1916.

PRESENTATION OF SPECIMENS, INSTRUMENTS, ETC., AND REPORT OF CASES.

Dr. Bennett of Arabia: I apologize for appearing before a medical society of this kind, because I am really simply a surgeon, and have been for ten years a medical missionary in Mesopotamia. It happens that out there we have a great many stones in the bladder, and I have a few specimens here.

Five years ago I brought home about 35 specimens, and left them at the University of Michigan.

I would say that now I gather very few, because we do most of them by lithotomy, except where the urethra is blocked.

These, I think, are interesting simply from the point of view of their size. Probably the Arabs allow them to grow more than the Americans do. These have all been sterilized so I will pass them around. There is one they attempted to crush. I have broken my lithotrite in attempting to crush a big stone like that. In this case the man died, and so did the owner of the second large one. These others I think were more successful. One was removed from a boy about five years of age. In fact, most of these stones were removed from children. I have removed stones from children of two or three years of age, while they were still at their mothers' breasts.

I have a theory that some of these stones are caused by the bilharzia worm. The life history of a bilharzia worm, as we have established it, is that the bilharzia enters perhaps through ingestion, but more probably through the skin of the feet, and the Arabs, who work in the rice and wheat fields, are up to their ankles in mud which is full of bilharzia worms. The poison of this bilharzia is really a sharp horn on its anterior end and probably enters the circulation that way and reaches the liver. There it is found in the portal veins and the mesenteric veins, but there the worm is not fully developed, and in the post mortem they are small. They are more fully developed when found in the bladder and rectum. It seems to have an affinity for the walls of the bladder and rectum, more especially for the bladder, and we have cases coming to us giving symptoms of difficult micturition with blood and mucus and some times chyluria. All this is, I think, probably the cause of a large number of cases of stone in the bladder. We get renal calculi, but they are very infrequent.

If you study the life history of the bilharzia you will find that the male worm has a central fold. This encloses the female worm, which is a long, slim worm, and this lies in that ventral fold and the ova are generated in the walls of the bladder and rectum. These passing out cause the irritation and the fungoid growths which are so common. I have seen great, large, mushy growths which project both from the rectum and from the different fistulae which are found through the perineum, and it is very difficult to heal them. In fact, I do not know that they can be healed unless possibly a change of climate is brought about.

Dr. F. B. Lund, Boston: The chief interest of this specimen of hypernephroma is that it illustrates the large size to which a malignant tumor of the kidney can grow without producing any cachexia. The patient's symptoms consisted of attacks of pain in the right side, with very slight hematuria, and he presented this very large mass.

On account of the absence of cachexia, I was inclined to think the mass might be a congenital cystic kidney, although ordinarily you can feel the separate cysts, and this was quite smooth. Dr. Cunningham, who saw the patient with me, thought it was a hypernephroma.

No catheterization of the ureters was done for psychic reasons. Several times he refused operation, and we were in great doubt as to whether we could get him to have it done at all.

The tumor, as you notice, was entirely beneath the kidney and pushed it far up beneath the liver so that the vessels ran upward and backward from the aorta and vena cava, necessitating very wide exposure. The usual long kidney incision was made, and then the lower end of it carried forward, splitting the abdominal muscles, up to and into the sheath of the rectus. This gave a beautiful exposure and there was no difficulty about removing the tumor. The left kidney was of normal appearance and there was no evidence of metastasis anywhere.

A DEVICE TO REPLACE THE RUBBER URINAL.

Dr. John Cunningham, Jr., Boston: I have here a simple device the use of which is to hold urine in the bladder when the bladder sphincter control is destroyed. This device takes the place of the rubber urinal, about the disagreeable features of which nothing need be said. This device compresses the urethra so that no urine may escape, whereby the bladder takes on its normal function as a reservoir. It does not disturb the circulation of the penis. It has been of much service in dilating contracted bladders by enabling the patients to hold the urine after the impulse to urinate has occurred. I have made use of it to hold fluid in the bladder in doing suprapubic prostatectomy.

Incontinence Clamp in Position.

The device was first made for a patient upon whom I resected about one-third of the bladder and removed the prostate for carcinoma three years ago, in which patient the sphincter control was lost by the use of the actual cautery. His bladder, when the device was first employed, could be distended only to three ounces. He now holds seven ounces. The device has taken the place of the rubber urinal in all cases of incontinence which have come under my care since that time. It is sold by Mr. Charles R. Bard.

A CASE OF TUMOR OF THE TESTICLE.

Dr. R. F. O'Neil, Boston: This specimen which I present is one of the so-called mixed tumors of the testicle. It was removed in April of this year. The patient had had it for a year and a half. The specimen at the time of removal was very much larger than it is now, and was also accompanied by a certain amount of hydrocele. At that time there were no metastases to be made out, but the operation was undertaken simply to remove this very large mass, without the idea of effecting a cure. I saw him again a week ago and there was a very extensive recurrence in the pelvis and in the groin. He is now being treated by radium and the x-ray.

A CASE OF CALCULOUS PYONEPHROSIS.

I wish to show this kidney which I removed this morning from a man 40 years of age. He has had symptoms for about a year and a half, although the lesion must have been present for a much longer time. You see the calculus, while not very large, is situated at the uretero-pelvic outlet, blocking the ureter, and has resulted in the complete destruction of the kidney. This kidney was situated high up under the ribs and was removed with difficulty. During its removal the renal vein either was torn or slipped from the clamp and we had a very sharp hemorrhage, which, fortunately, we were able to control.

SOME UNUSUAL URETERAL CALCULI.

These three calculi were removed from the ureter of a young man of about 25. You notice they are smooth and triangular, resembling teeth. The points of interest in this case are the enormous dilatation of the ureter which was present, the very good function of the kidney and the comparative absence of symptoms, together with the normal cystoscopic appearances of the ureter. If you notice, one of the x-ray plates shows two of the shadows apparently low in the ureter with a third up in the kidney region. Another plate shows all three shadows low in the ureter. The third plate, of the ureter injected with argentide solution, shows the enormous dilatation of the ureter which was present. Of course this was suspected, but I did not expect to find it to such an extent, in view of the perfectly normal cystoscopic appearance of the ureteric orifice. At operation the ureter was found much thickened and dilated; it was opened above the pelvic brim and stones removed with forceps. Incision in the ureter closed with a double row of stitches. Wound healed by first intention, never was there any leakage. Examination of the calculi showed them to be calcic oxalate.

Dr. Lesley H. Spooner, Boston: I wish to report on some bacteriological work which has been doing on renal tuberculosis.

Thanks to Dr. Chute and Dr. Crosbie, I received kidneys after operation *in toto*. They had not been mutilated for the sake of gross observation and for this reason I was enabled to get what I believe to be pure growth from these kidneys.

In all I have studied twelve kidneys, three of which were non-tuberculous and nine tuberculous, and I was able to grow in pure culture from six of them the tubercle bacillus. In three others no growth has appeared, although in some it is expected. In none of these nine tuberculous kidneys was I able to grow in any form any bacteria other than the tubercle bacillus. In the three non-tuberculous kidneys which were removed, two for stone and one for a septic process with a sinus, I grew pure cultures of pyogenic organisms. In two cases where the tubercle bacillus was later grown from the kidney, ureteral specimens showed no growth on ordinary culture media, but in both instances acid-fast bacilli were demonstrated microscopically. Strangely enough, from these cases I did grow from the bladder catheter specimens various organisms such as the staphylococcus and diphtheroids.

I advance as a tentative conclusion from the work that the tubercle bacillus may be grown in pure culture from many tuberculous kidneys; that in no instance were other organisms grown; and that tuberculous caseation is due to the action of the tubercle bacillus alone. The bladder urine in cases of renal tuberculosis may contain other organisms, while that from the ureter does not seem to be contaminated. Sufficient work has not been done to make the last two statements with certainty, however, and further experiments are to be performed as soon as possible.

I will say one word as to the method of procedure. The kidneys were delivered to me without being opened, the ureters tied off and the kidneys wrapped in sterile gauze from the operating table. I got them within two or three hours after operation. They were opened on a flat surface and scarified immediately with a red hot plumber's soldering iron. All work was done with instruments which were heated to a red heat in the flame and then cooled in boiled water, so that there was no chance of contamination. There was no possibility of killing the organisms by transmitted heat, and yet there was every chance of getting the material in its natural state. A wide variety of aerobic and anaerobic culture media was employed. It was found that the tubercle bacillus in primary culture was more profuse upon Dorset's egg media; but that secondary growth flourished readily upon glycerine agar. (Photographs of the cultures upon the latter shown.)

DISCUSSION OF DR. SPOONER'S REPORT.

Dr. D. N. Eisendrath, Chicago: This subject interests me greatly. I had been considerably interested in cases of so-called mixed infection with tubercle bacilli. I am just recalling a case which occurred last winter in a young man 20 years of age who had been sick only 10 days. His clinical symptoms were those of ordinary acute hematogenous infection. I cut down upon the kidney and found a cortical abscess, and had some pus sent down to the laboratory immediately. They found the Staphylococcus aureus in pure culture. We had not suspected tuberculosis because the temperature was not typical. The urine was clear, and I was very much surprised when the laboratory reported that in addition to the Staphylococcus aureus they found tubercle bacilli in large quantity.

We took out the kidney the following week and it confirmed the diagnosis of a mixed infection, the Staphylococcus aureus predominating.

Book Reviews.

Social Diagnosis. By Mary E. Richmond. New York: The Russell Sage Foundation 1917.

This volume, based on the author's personal experience in charitable and social service, and issued as a publication of the Russell Sage Foundation, is intended as a textbook on social work in Canada. Its genesis and evolution are described in the preface. The text is divided into three parts, dealing, first, with the methods of obtaining, compiling and studying social evidence; second, with the processes leading to social diagnosis; and third, with the variations in these processes necessitated in the study of certain special groups of cases. The second part, which constitutes one-half the volume, deals in detail with the methods and steps of investigating families and individuals and the use of different sources of information and control in dealing with them. The third part consists largely of detailed series of questions useful in approaching special types of cases. The book is an elaborate treatise on the technic of social investigation and, as such, should prove useful to all concerned in this form of activity.

State Board Questions and Answers. By R. Max Goepp, M.D. Fourth Edition, revised. Philadelphia and London: W. B. Saunders Company. 1917.

The second edition of this useful work was reviewed in the issue of the Journal for July 27, 1911 (Vol. clxv, p. 141); and the third edition in the issue of April 2, 1914 (Vol. clxx, p. 553). In this fourth edition considerable new material has been added, particularly with regard to the newer laboratory tests in the study of diseases of the kidneys and disturbances of metabolism. Additions have also been made in regard to the practical application of serologic tests in diagnosis and treatment. The text is brought to date by the gathering and synthesis of many new questions from state board examinations of recent years. The volume should continue its effective value for students and teachers concerned in the preparation for these examinations.

Case Histories in Obstetrics. By Robert L. DeNormandie, A.B., M.D., F.A.C.S. Second Edition. Boston: W. M. Leonard. 1917.

The first edition of this volume in the Case History Series was reviewed in the issue of the Journal for February 18, 1915 (Vol. clxxii, p. 365). In this second edition, several alterations have been made for the purpose, as the author states in his preface, of clarifying the meaning of the text, though it should not seem, from the excellent and detailed style of the original, that changes for this reason were necessary. The sections in which the most material alterations have been made are those on accidental hemorrhage, sepsis, pyelitis and scopolamine-morphine anesthesia. Some material has also been introduced on the use of nitrous oxide in obstetrics and further data are given on the subsequent history of some of the cases. These additions, representing the development of the subject in the author's experience, increase the already established value of his work as a contribution to the teaching and practice of obstetrics.

A Manual of Pharmacology, and its application to Therapeutics and Toxicology. By Torald Sollmann, M.D., Professor of Pharmacology and Materia Medica, Western Reserve University, Cleveland, Ohio. Octavo of 901 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1917. Cloth, $4.50 net.

The author's division of his monumental labors into a laboratory guide of pharmacology and a manual containing eight hundred and eighty-seven pages of text, including a bibliography, is to be heartily commended.

The manual possesses the greatest value for physicians, in that most of the ineffective drugs are frankly omitted or mentioned in a few lines of fine print, while the more important ones, which have been proved effective, by careful scientific observation, are given their deservedly prominent position. The author does not look with favor upon the conversion of the old term "cubic centimeters" to "milliliters" as recommended both by the United States and British pharmacopeias.

The section devoted to prescription writing is simple, easily understood and in a brief perusal, with some study, ought to equip the student for correct prescription writing.

The section on ferments presents the modern view with regard to the inefficiency of the therapeutic use of digestive enzymes, as well as the ample destructive action of one upon another. The author also explodes the theory of the use of pancreatic preparations in diabetes which physicians have already looked on with suspicion, though they have had no absolute proof of their lack of efficiency.

The viburnums, too, long employed by the medical profession, have received their death warrant at his hands.

A remarkably able discussion of anaphylaxis is given on page three hundred and sixty-nine, which includes all of the modern views on this obscure subject.

The discussion of the action of digitalis on the heart in health and in disease brings light on many obscure activities of this drug, and will check not only its indiscriminate use, but particularly, its abuse in cardiac stenosis.

The section on the action of dilute hydrochloric and other aids on digestion and pyloric control, adds much to our present knowledge, correlating all of the discoveries made within the last few years.

Many a physician's firm reliance on certain drugs and preparations will receive a rude shock at the hands of this author, who confirms every statement of incredulity in their efficacy by the unquestioned proof of experimental investigation. On the whole, no work has appeared in recent years on which the physician may rely with greater security.

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TUBERCULOSIS IN THE ARMY.

The problem of tuberculosis, like many others at this time, takes on a new aspect under the conditions of war and military duty. The appalling spread of pulmonary tuberculosis among the French troops has created a grave problem of public health in France, and the large incidence of the disease in the Canadian army has caused no little concern to military and sanitary officers. Not a few alarmists have predicted the same wholesale infection and destruction of our own troops. On careful consideration of all the facts, however, it becomes clear that much of the disease in the French army was due to the fact that many of the men were already tuberculous when sent to the front. The terrible need for every man who could be mobilized, forbade any examination for more than obvious physical incapacity to carry a rifle. Thousands who in any less haste would have been rejected were passed, to their own speedy breakdown. These, under the forced intimacy and hardship of trench life, became a menace to fellow troops. Some part of the Canadian problem had a similar basis in lack of thorough appreciation that military duty in the field requires a degree of physical health much greater than for active work in civil life. In the examinations made for enlistment in the National Guard in this country, and for the Reserve Officers Corps, this fact has not always been recognized.

The army authorities, appreciating both aspects of this problem, have determined on a scheme by which they hope to prevent, as far as possible, this wastage of men, both as troops and as civilians, and to avoid the future cost in pensions. They plan to have every man now in service in the army, the Reserve Officers' Camps, and the National Guard, as fast as called into federal service, reëxamined by men trained in correct methods of physical examination, to eliminate cases of active or obvious pulmonary tuberculosis.

For this work they ask the volunteer services of experienced physicians, trained in careful chest work. These men are to be commissioned as lieutenants in the Medical Corps and receive pay as such. They will be sent to the various army posts and camps, as far as possible, in their immediate territory, to save cost of transportation and the delay of travel. In view of the special and restricted nature of the service, the rigidity of physical examination required for regular commissions will be remitted and the age limits extended.

That the best men possible may be secured, the service will be made temporary, and men accepting it may be released at the end of three months, though it is desired to have them serve longer. For these reasons of limited service, commissions will be given only as lieutenants, higher rank as due to age or professional standing not being possible.

The work is to be expedited by having an adequate group of such officers sent to each post and camp at once, by July 1, as far as possible. It is desired to examine the enlisted men in posts and the officers at reserve camps at once. Following this, the personnel of the National Guard next to be called into service will be reviewed, and the way cleared to the new national army as fast as it is selected and sworn in.

It is not expected that this will prevent all tuberculosis in our forces, but it is hoped to reduce greatly its development. No army could be raised if every latent or possible future case of tuberculosis were rejected. But by a careful reëxamination of the chests by men of experience it is hoped to hold down the incidence to a minimum.

The appreciation of the signs of an active incipient case of tuberculosis is not yet the common possession of every physician, and the realization of the physical requirements to meet the strain of military service rarely part of the knowledge of the civilian practitioner. Through these two gates of ignorance pass the greater number of cases of tuberculosis in our army. To guard from the start the source of trouble, and to find at once the cases which have slipped past, before length of service even in camps of training, raises the question of "disability acquired in line of duty," and to prevent further acceptance of known cases of tuberculosis, is the great purpose of this work.

Its value in preventing serious ineffectiveness in the fighting ranks, in saving to useful civil, working power the incipient case which would otherwise suffer from the over-physical strain of war, and in reducing the future cost of pensions, is beyond estimation.

It is a service which should receive the heartiest support of the medical profession. Its success will depend on the type of men who respond to the call. It is a rare opportunity for those of exceptional skill and experience to give for a brief period the best of help. Many, who for reasons of duty or age, cannot follow their desires into the field in line or hospital, can here rejoice in a chance to serve usefully and wear the honor of their country's uniform.

MEDICAL NOTES.

Honorary Degrees to Physicians.—At the commencements of the various American universities last month, several honorary degrees were conferred upon physicians as follows: At Yale the degree of Sc.D. was conferred on Dr. Theobald Smith, director of the department of animal pathology of the Rockefeller Institute. Dr. Smith and Dr. Charles H. Mayo, retiring president of the American Medical Association, also received the same degree from Princeton. At Bowdoin the honorary doctorate in science was conferred on Dr. Fred H Albee of New York, who has recently returned from service at a base hospital in France.

Health Conditions in South America.—Dr. Richard M. Pearce, professor of research medicine in the University of Pennsylvania, has returned from a tour of three months through Brazil, Argentina and Uruguay to make a study of the medical, hospital, educational and public health conditions in those countries in the interest of the International Health Board of the Rockefeller Foundation.

Medical Research.—The General Education Board founded by John D. Rockefeller has donated a million dollars to Washington University, St. Louis, to be used in research in the subjects of surgery, medicine and pediatrics.

Health Report, Montclair, N.J.—According to the recently published twenty-second report of the Board of Health of Montclair, N. J., the mortality rate for the past year was 10.56 per thousand inhabitants. The chief causes of death were organic diseases of the heart, pneumonia, cancer and tuberculosis. The deaths due to cancer represent an increase of 100% over those of fifteen years ago.

Prevalence of Disease in the United States.—The weekly report of the United States Public Health Service for June 1, 1917, states that during the month of April there were reported in Mississippi, 7222 cases of malaria, 961 of pellagra, 221 of smallpox, and 188 of typhoid fever. During the same period there were 206 cases of cerebro-spinal meningitis in Pennsylvania, 94 in Minnesota, 25 in Kansas and 14 in Indiana. There were 15 cases of poliomyelitis in Pennsylvania, 246 of smallpox in Minnesota and 89 of typhoid in Indiana. There were 496 cases of smallpox in Indiana and 303 of typhoid in Pennsylvania.

In the weekly report of June 8 it is further noted that during the first five months of 1917 there were 274 cases of cerebro-spinal meningitis in Minnesota with 113 deaths. There were eighty cases of the disease in Connecticut in April. During that month there were 445 cases of malaria in Virginia, 108 of pellagra in Alabama, 572 of smallpox in Arkansas and 74 of typhoid fever in Montana.

London Death Rates in April.—Statistics recently published show that in April, 1917, the total death rate of London was 18.2 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 22.3 in St. Pancras, a populous northern area, and the lowest was 13 in the financial district of the city.

Prevalence of Meningitis.—The weekly report of the United States Public Health Service for June 15, 1917, states that during the month of April, 149 cases of cerebro-spinal meningitis were reported in Ohio. During the year 1916 there were 327 cases of this disease in New York, 162 in Pennsylvania, 152 in Ohio and 150 in Massachusetts.

WAR NOTES.

London Chapter of American Red Cross.—There has been formed in England a London Chapter of the American Red Cross. One of the first acts of the Chapter was to plan for the establishment of headquarters for American nurses in the war zone. The chairman, Mrs. Whitelaw Reid, said that it would be a home where nurses could go when on leave from their duties in France and where those passing to England from the United States would find accommodations.

Gift of Ford Ambulances.—The Ford Motor Company, in a meeting of its directors, voted to donate $500,000 worth of Ford ambulances to the Red Cross.

Aid to Russia.—The American Red Cross has arranged to send an American commission to Russia to work behind the battle front in the same way as the commissions work in France and Belgium. This will enable the Red Cross to send its supplies and relief corps to the Russian front.

Appointment to War Council.—The appointment has been announced of Dr. Charles V. Chapin of Providence, R. I., to the War Council of the American Red Cross. The council consists of a commission of ten to advise on matters relating to the European War relief and army health. Simon Flexner of New York will be chairman of the commission, and Dr. Milton J. Rosenau will be another of its members.

Public Health Nurses to Remain at Home.—The Instructive District Nursing Association of Boston has drawn up resolutions to the effect that public health nurses are most needed at their posts at home, on the ground that the public health nurse is helping to conserve the most precious of national resources, human life, and is serving her country no less than the nurse at the front. These resolutions are indorsed by the Massachusetts Committee of Public Safety, the Massachusetts Commissioner of Public Health and the Executive Committee of the Massachusetts Committee of Directors of Visiting Nursing Associations.

Additional Equipment for Base Hospital No. 5.—The additional workers asked for by Major Harvey Cushing of Base Hospital No. 5 have been recruited and will go to France as soon as possible. They include forty men, twenty nurses and five doctors.

Appointments for Service in France.—The American Red Cross has appointed Dr. Alexander Lambert of New York as medical adviser to the War Relief Commission of the Red Cross during the war. Dr. Tom A. Williams of Washington will go to France as neurologist in the French Service de Santé.

Call of the Medical Departments of the National Guard.—The officers and enlisted men of the medical corps of the National Guard units in New England have been called to the South to undergo three month' course in instruction at the medical department training camp at Fort Oglethorpe, Ga. There will also be sent a number of officers and enlisted men of the sanitary troops connected with the regiments already in Federal service to Fort Ethan Allen, Vt., for a similar course in instruction. The men chosen for the Oglethorpe camp were all picked out in Washington and the list forwarded to department headquarters and to the adjutants-general of the several states.

Massachusetts has fifteen officers and forty-six men; New Hampshire, five officers and thirteen men; Maine, two officers and four men; Connecticut, six officers and twenty-one men, and Rhode Island three officers and thirteen men. These men were mustered into the Federal service and were ordered to report at Fort Oglethorpe on June 25. The Massachusetts men will be under the command of Major George F. Keenan.

Entertainment of Chicago Unit.—The Red Cross Base Hospital recruited from Chicago has been enthusiastically received and entertained in London. On one occasion Sir Thomas Lipton invited the unit to his country place. Among the guests were Dr. Richard P. Strong of Harvard and the Italian bacteriologist, Dr. Castellani, both of whom were associated with Sir Thomas Lipton in combating the typhus plague in Serbia. Dr. Strong addressed the company and spoke highly of the work inaugurated by Sir Thomas Lipton in Serbia and expressed appreciation of the aid given the American Red Cross.

French War Cross to American.—Dr. George Dock, professor of medicine in the medical school of Washington University, has received the French war cross and has been mentioned for his service in moving wounded soldiers under heavy bombardment while engaged in the American Field Ambulance Service.

Appeal for Surgical Dressings Fund.—The Surgical Dressings Committee again appeal to the public for contributions to their work. The dressings prepared by the committee at the Peter Bent Brigham Hospital and its branches are done so well and are so much depended upon by many hospitals abroad that any decrease in their supply would be a calamity in the present crisis.

An indication of the extent of the work of the committee (and the value of this work to the Allies) is found in its report of shipments in May, which amounted to 601 cases, containing 814,719 dressings. This was an increase of 181,431 dressings over March—the next highest month.

All subscriptions should be made payable to the Surgical Dressings Committee and forwarded to the Old Colony Trust Company, 17 Court street, Boston.

Berkshire Ambulance Unit.—The Berkshire Ambulance Corps of eighty-six men has been mustered into Federal service. The unit is led by Dr. R. J. Carpenter of North Adams and consists of twelve automobile ambulances furnished by the citizens of Berkshire County.

Hospital Supplies for the French.—The New England branch of the American Fund for French Wounded has sent in the last month 194,533 surgical dressings to France. Besides these the shipments included 14,800 yards of surgical gauze, 1,020 pounds of absorbent cotton, 1,100 pounds of chloroform and ether, 1,500 yards of adhesive plaster, 2,737 yards of mosquito netting, 9,063 hospital garments, 12,114 towels, wash cloths and handkerchiefs and large quantities of many other useful and necessary articles. The Branch appeals for absorbent cotton and surgical gauze both of which are difficult to obtain in France and the need of which is most urgent.

Commission to Study Battle Conditions.—A commission headed by Major Hugh-Hampton Young, M.R.C., director of the Brady Institute of Johns Hopkins Hospital has left this country for England to study medical necessities at the battle front and to take charge of the medical care of the American Army in France.

Dr. Young will be accompanied by Captain Louis C. Lehr, of Georgetown University, Captain Montague L. Boyd, of Emery College, Atlanta, and Lieutenant Howard L. Cecil, of the Brady Institute, Johns Hopkins Hospital.

Surgeons in Training Camp.—The following officers and men have been chosen by Colonel Frank P. Williams, surgeon general of the National Guard of Massachusetts to attend a three months' training camp at Fort Oglethorpe, Ga. They are Lieutenant William H. Barrow, First Field Hospital Company; Captain James F. Coupal, Coast Artillery; Lieutenant Joseph H. Dunn, Coast Artillery; Lieutenant Gustave P. Grabfield, First Ambulance Company; Lieutenant Albert A. Horner, First Regiment Field Artillery; Lieutenant Herbert L. Johnson, Fifth Infantry; Major George F. Keenan, office chief surgeon; Lieutenant Eugene J. McCarthy, Second Ambulance Company; Lieutenant Peter G. McKenna, First Ambulance Company; Lieutenant Harold F. Parker, Second Field Hospital Company; Lieutenant Ruel A. Pierce, First Field Hospital Company, Lieutenant James J. Rodger, Second Field Hospital Company; Lieutenant Edward B. Sheehan, Second Ambulance Company; Lieutenant Conrad Wesselhoeft, Eighth Infantry; Lieutenant James J. Walsh, Fifth Infantry.

American Units in France.—The American Red Cross units from St. Louis and Philadelphia, numbering in all about four hundred persons, have left England for France. Each unit will care for five hundred beds.

War Relief Funds.—On June 30 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$235,303.52
Armenian Fund	197,104.79
Serbian Fund	122,638.66
Surgical Dressings Fund	103,488.47
British Imperial Fund	101,737.59
Metropolitan Red Cross Fund	72,576.79
French Phthisis Fund	67,469.33
Italian Fund	42,549.37

BOSTON AND MASSACHUSETTS.

Brockton Health Conditions.—The Department of Public Health of the City of Brockton has recently issued its thirty-fifth annual report, which covers the year 1916. The mortality rate during this period was 11.92 and the infant mortality rate was 90.2. There were 1,541 births registered of which 70 were stillbirths. Deaths under a year totaled 138. Immediately upon receipt of the birth return, a circular and Baby Book are mailed to the mother in regard to necessity for reporting any redness, swelling or discharge from the eyes of the infant. Three baby clinics were maintained during the summer at Baby Hygiene stations where demonstrations and instructions were given by nurses and advice and treatment by doctors. The total attendance at these clinics was 752, which meant a total of individual babies of 247. Following the clinics the nurses visited the babies in their homes, and in all 696 visits were made.

Northeastern Dental Society.—The members of the Northeastern Dental Society held an outing at Baker's Island, near Salem, Mass., on June 20. A clambake and athletic events were the features of the occasion.

Dental Alumni Association.—The Harvard Dental Alumni Association held its forty-sixth annual meeting and dinner on May 22. The following officers were elected for the coming year: Dr. Frank T. Taylor, president; Dr. J. William O'Connell, secretary; Dr. John W. Estabrook, treasurer.

NEW ENGLAND NOTES.

Poliomyelitis in Vermont.—On June 28th, a total of 16 cases of poliomyelitis had developed in Vermont. Two cases were in Waitsfield, two in Barre and 12 in Montpelier. Three of the victims were children and the others were under twenty years of age. Two suspicious cases are being watched in Montpelier, where all public assemblies have been forbidden.

The Massachusetts Medical Society.

PROCEEDINGS OF THE SOCIETY.

First Day, June 12, 1917.

Clinics and demonstrations were held during the morning at the principal hospitals of Boston. All of the exercises of the anniversary were held at the Copley-Plaza Hotel, Boston, beginning with the annual meeting of the Supervisors, June 12, at 11.30 a.m., in the foyer, followed by the annual meeting of the Council in the same room, at noon, 126 Councilors being present. Meetings of the Sections of Medicine, Surgery, Tuberculosis and Hospital Administration, the last being a new section this year, were held in the afternoon in the different rooms of the hotel; a detailed and corrected program of the meetings and the officers is to be found in the Boston Medical and Surgical Journal for June 7, 1917, Vol. clxxvi, pages 822-824.

The following officers of the sections were elected for the ensuing year by the sections:

Section of Medicine: *Chairman,* William H. Smith, Boston; *Secretary,* George R. Minot, Boston.

Section of Surgery: *Chairman,* John Homans, Boston; *Secretary,* Hilbert F. Day, Boston.

Section of Tuberculosis: *Chairman,* Walter G. Phippen, Salem; *Secretary,* John B. Hawes, 2d, Boston.

Section of Hospital Administration: *Chairman,* Homer Gage, Worcester; *Secretary,* Channing C. Simmons, Boston.

The Shattuck Lecture was delivered in the evening by Dr. David Cheever of Boston, who read the lecture prepared by Dr. Walter B. Cannon, George Higginson Professor of Physiology in the Harvard Medical School, Dr. Cannon being absent in the service of the country in the war. Subject: "The Physiological Factors Concerned in Surgical Shock."

Following the lecture there was a reception to the President and a concert and refreshments.

Second Day, June 13, 1917.

The Society met at the Copley-Plaza Hotel, Boston, for the exercises of the one hundred and thirty-sixth anniversary. The President, Dr. Samuel B. Woodward of Worcester, was in the chair and about a hundred Fellows were present during the morning. The minutes of the last meeting were read and accepted. The Secretary announced that during the past year the Society had lost by death 53 Fellows, by resignation 24, by deprivation of the privileges of fellowship 61, total loss 138. The Society had gained 171 Fellows as follows: restoration by the Council 4, readmitted by the Censors 2, new Fellows 165, total net gain 33, making the membership of the Society, June 13, 1917, 3666.

Dr. G. P. Twitchell explained in detail the following amendments to Chapter V of the By-Laws, that had been submitted to the Council, October 4, 1916, by the Supervisors:

Page 17, Section 1 (*Board of Supervisors*), line 7, to follow the word "board," this sentence: He shall call special meetings at the request of five supervisors.

Same page, same section, third paragraph (*Diplomas of colleges not on list*), add at end of paragraph, deleting the period, the following: by the district secretary before an applicant is permitted to take an examination.

Same page, same section, last paragraph (*Examinations; when held*), second line, delete "at 2.00 p.m."; also next line, change the word "second" to "first" in the two places where it occurs.

Page 18, Section 2 (*How applications are made*), first line, substitute the word "fellowship" for the word "examination."

Same line, after the word "apply," insert the following: on blanks furnished for the purpose. . .

Same section, end of second line, delete the semicolon and add the following: at least one week before the date of a given examination.

Same page, Section 3 (*Duties of district secretaries*), second line, to follow the word "censors," add the following: shall furnish applicants with blanks adopted by the board of supervisors; they. . .

No objection being made to considering all the amendments *en bloc*, they were passed unanimously.

The Chairman read the following amendment to Chapter VI of the By-Laws that had been submitted to the Council February 7, 1917, by the Standing Committee on Membership and Finance:

That the fourth paragraph of Chapter VI, Section 4, be amended so that it shall read: He shall attend the meetings of the Committee on Membership and Finance, furnish the committee with such data on membership and finance as the committee may require, and shall make all investments and reinvestments of the Society's funds subject to the approval of this committee.

The Treasurer stated that he thought the amendment a desirable one and favored its passage, and it was passed with no negative votes, twenty-five Fellows being present.

Dr. Edsall introduced this preamble and these resolutions, and moved their adoption:

Whereas, Senate Joint Resolution No. 63 has been introduced into the Senate of the United States with a view of controlling certain sanitary conditions in this country incident to our state of war, and has been endorsed by the Council of National Defense and all its subsidiary organizations, including the Medical Corps of the Army and Navy, the Treasury Department of the United States, and the executive officers of forty-three State Boards and Departments of Health assembled in conference, therefore, be it

Resolved: That in the opinion of the Massachusetts Medical Society this Resolution should be speedily enacted into law as offering a practical means for joint administrative control by Federal, State and local authorities of sanitary conditions beyond the jurisdiction of the military authorities, arising in connection with the establishment of military camps, and for controlling other extraordinary conditions incidental to a state of war, and be it further

Resolved: That the President and Secretary of this Society be directed to transmit copies of this Resolution to the Senators and each of the Representatives in Congress from the Commonwealth of Massachusetts.

After some questions had been asked and answered the resolutions were adopted by a unanimous vote.

Dr. Cook presented the following resolutions and they were passed:

Resolved: That in the belief of the Massachusetts Medical Society the public health would be greatly benefited by the restoration of the regulations concerning venereal prophylaxis that were abolished by the Secretary of the Navy, therefore it is

Resolved: That the Secretary of the Navy be urged to restore these regulations in the Navy, and that the Massachusetts Senators and Representatives in Congress be requested to coöperate in bringing this about.

The President announced the names of the committee of five he had appointed "to look into the matter of an academic chair of Military Medicine in this Commonwealth," in accordance with a resolution passed by the Council the previous day, as follows:

E. H. Bradford, *Chairman,* E. C. Streeter, A. N. Broughton, P. P. Johnson, P. E. Truesdale.

The President read the resolution that had been passed at the annual meeting of the Council, placing the Society on record as in favor of prohibition for the duration of the war, and it was adopted unanimously, and another resolution, passed at the same time, namely, be it

Resolved: That the Massachusetts Medical Society emphatically urges its members, especially the younger men, to offer their services to the Medical Reserve Corps of the United States Army; and it was adopted.

Papers on Certain Aspects of the Hazards of Industry were read, according to the program as printed in the Boston Medical and Surgical Journal, June 7, 1917, except that Dr. Edsall summarized and included in his remarks the paper that was to have been read by Dr. Wade S. Wright, who had been called away in the service of the country. Discussion of all the papers was participated in by Dr. A. N. Broughton, Dr. J. J. Minot, Dr. Eugene J. McCarthy and Mr. Edwin Mulready. On motion by Dr. Albert Evans it was

Voted: That the Council be asked to appoint a special committee to work in coöperation with the State Board of Labor and Industries.

At noon the Annual Discourse was delivered by Dr. P. E. Truesdale of Fall River. Subject: "Military Medicine; a Means to Perpetuate Its Teaching in Massachusetts."

In the afternoon the Combined Sections of Medicine and Surgery met in the salon of the hotel and listened to six papers and discussions, as set forth in the program as printed in the Boston Medical and Surgical Journal for June 7, 1917.

The Annual Dinner was served in the ballroom in the evening to 690 Fellows and guests. Grace was said by the Rev. Austin S. Garver. The President made an address and also acted as anniversary chairman, introducing as speakers, the Hon. Calvin Coolidge, Lieutenant-Governor of Massachusetts; Major F. F. Simpson, of the Medical Board of the Council of National Defense; Major H. D. Arnold, of the Medical Officers Reserve Corps; Dr. A. J. McLaughlin, Health Commissioner of Massachusetts; the Rt. Rev. William Lawrence, Bishop of Massachusetts; and President A. Lawrence Lowell of Harvard.

Adjourned at 10.20 p.m.

Walter L. Burrage,
Secretary.

Deaths Reported from June 7, 1916, to June 13, 1917.

Admitted	Name	Place of Death.	Date of Death	Age.
1880	†Abbott, Stephen Wendell	Waverley	Sept. 1, 1916	68
1908	Barrows, Sterling	Worthington	Aug. 16, 1916	36
1876	**Bell, William Appleton**	**Somerville**	**Apr. 3, 1917**	**65**
1872	†Blodgett, Albert George	Ware	Feb. 10, 1917	75
1881	†Brown, Francis Henry	Boston	May 16, 1917	81
1916	Buck, Charles Edward	Boston	May 11, 1917	58
1874	Buckingham, Edward Marshall	Boston	Dec. 23, 1916	68
1877	Cunningham, Thomas Edward	Cambridge	Feb. 27, 1917	66
1875	†Cushing, Ernest Watson	Boston	Aug. 27, 1916	69
1856	†Cutter, Ephraim	West Falmouth	Mar. 7, 1917	84

Admitted.	Name.	Place of Death.	Date of Death	Age.
1899	Davis, Percy Guy	Deerfield	Oct. 20, 1916	49
1914	Dodd, Walter James	Boston	Dec. 18, 1916	46
1879	Eaton, Willis Gilbert	Lowell	June 26, 1916	62
1910	Frost, Henry Pinckney	Boston	May 23, 1917	48
1903	Gay, Herbert Seymour	Boston	Apr. 21, 1917	46
1893	Gay, Warren Fisher	Boston	Aug. 26, 1916	50
1872	†Gilman, Eugene Albert	Dorchester	June 17, 1916	74
1869	Hanscom, Sanford	Somerville	Sept. 20, 1916	75
1899	Haviland, Nathaniel Clark Bacon	Worcester	Apr. 22, 1917	63
1903	Hayes, Wentworth Larrabee	So. Yarmouth	Aug. 13, 1916	39
1900	Holt, Frank Hammett	Chicago	Aug. 3, 1916	47
1909	Hoole, John Edward	Somerville	Feb. 15, 1917	49
1913	Keany, Francis Joseph	Boston	Nov. 23, 1916	50
1880	†Lane, Albert Clarence	Boston	Feb. 1, 1917	65
1902	Lithgow, Robert Alexander Douglas-	Boston	Feb. 16, 1917	70
1898	Lockary, Joseph Logue	St. Stephen, N. B.	Aug. 13, 1916	45
1887	Lyon, Arthur Vinal	Brockton	Feb. 21, 1917	54
1896	McIntosh, Herbert	Cambridge	April 24, 1917	60
1890	Meigs, Joe Vincent	Lowell	Mar. 9, 1917	50
1896	Merrill, Arthur Ellsworth	Somerville	Mar. 17, 1917	51
1917	O'Brien, John Charles, Jr.	Greenfield	May 23, 1917	26
1886	O'Shea, Joseph Francis	Lynn	Mar. 29, 1917	54
1877	Parks, Edward Luther	Boston	Feb. 8, 1917	67
1895	Pedrick, Stephen Augustus	Rowley	Jan. 11, 1917	45
1874	†Pillsbury, Warren Wilbur	Newburyport	Apr. 1, 1917	69
1886	Pomeroy, Hiram Stirling	Auburndale	Apr. 20, 1917	69
1866	Rice, Charles Henry	Fitchburg	Jan. 5, 1917	73
1902	Robinson, Harry Pringle	Amesbury	Nov. 28, 1916	40
1883	Sanborn, Frederick James	Spencer	Nov. 20, 1916	55
1869	†Seymour, Christopher	Northampton	May 19, 1917	74
1895	Shea, Thomas Bernard	Boston	Mar. 25, 1917	54
1874	Spear, Edmund Doe	Jamaica Plain	Dec. 25, 1916	65
1912	Staples, Hall	West Acton	Mar. 7, 1917	46
1913	Stone, Charles Edwin	Lynn	Nov. 5, 1916	48
1889	Stone, George Arthur	Pigeon Cove	July 28, 1916	50
1875	†Tucker, Edward Tobey	New Bedford	Apr. 10, 1917	67
1896	Thompson, John Joseph	Webster	Sept. 16, 1916	56
1884	Underwood, George Baker	Gardner	Feb. 2, 1917	62
1913	White, Robert Marshall	Dorchester	Feb. 13, 1917	36
1870	†Willis, Reuben	Roxbury	Sept. 6, 1916	73
1880	Withington, Charles Francis	Boston	Jan. 7, 1917	64
1873	†Woodbury, Louis Augustus	Groveland	July 18, 1916	71
1882	Woods, Jonathan Henry	Brookline	Nov. 16, 1916	65

Total, 53 deaths.

† Retired Fellow.

Admissions Reported from June 7, 1916, to June 13, 1917.

Year of Admission.	Name.	Residence.	Medical College.
1917	Aaronson, Jacob	Lawrence	11
1917	Aimone, Victor Anthony	Winchester	4
1916	Allen, Arthur Wilburn	Boston	6
1916	Alley, Ernest Jason	Billerica	22
1916	Aronson, Charles	Salem	12
1917	Avedisyan, Avedis Der	Roxbury	12
1917	Azadian, David George	Boston	12
1917	Baker, Harold Nicholas	Rockport	29
1917	Barnes, Frederick Rigby	Fall River	19
1916	Barron, Maurice Edward	Boston	12
1917	Bass, Harris	Everett	12
1917	Bassow, George Joseph	Athol	36
1916	Battershall, Jesse Wolfenden	Attleborough	12
1917	Beaudet, Elphege Aleime	Lowell	12
1916	Berman, Myer Isadore	Dorchester	12
1916	Berr, Alfred William	Lawrence	12
1917	Berry, Walter Durant	Braintree	27
1916	Bober, Bessie Angela	Northampton	39
1916	Bolduc, Alfred George	Attleborough	12
1917	Briggs, Joseph Emmons	Boston	10
1917	Buck, William Edgar	Wilmington	5
1916	Butler, Alice Etta	Boston	12
1917	Butler, Samuel	Medway	36
1916	Cass, Frank Ozro	Provincetown	10
1917	Chadwell, Orville Rogers	Jamaica Plain	10
1916	Chalfen, Samuel Edward	Cambridge	12
1917	Chisholm, Lawrence Chesley	Salem	12
1916	Clark, DeWitt Scoville	Salem	11
1916	Cody, Peter White	Lawrence	25
1917	Cohen, Joseph Powitzer	Brookline	11
1916	Cohen, Milton Michael	Roxbury	12
1917	Cottle, Louis Albert	Worcester	19
1917	Croissant, Charles Augustus	Worcester	31
1916	Day, Edward Philip	Dorchester	5
1917	DeMarco, Thomas Andreas	Springfield	42
1917	Dennett, Paul Carroll	Chelsea	12
1916	Derby, Frederick William	Boston	12
1916	Dervin, Peter John	Dorchester	15
1917	Dillon, William Joseph	Springfield	32
1917	DiMento, Vincent James	Boston	12
1917	Dole, Kenneth Llewellyn	Jamaica Plain	11
1917	Ducharme, Alphonse Napoleon	Worcester	12
1916	Duff, John, Jr.	Charlestown	12
1916	Easter, Edna Frances	Worcester	12
1917	Edelstein, Samuel	Roxbury	12
1917	Emerson, Frederick Lincoln	Dorchester	10
1917	Foot, Nathan Chandler	Milton	17
1916	Foster, Arthur Neville	Dorchester	26
1917	Fowler, John Richard	Spencer	29
1916	Fregeau, Aimé Napoleon	Fitchburg	12
1916	Friedman, Eli	Boston	12
1917	Gay, William Madison	Sharon	19
1916	Gennert, Jacob	New Bedford	16
1917	Ginsburgh, Nathan Harry	Brockton	10
1916	Grant, Winifred Margaret	Worcester	12
1916	Grogan, Margaret Victorine	Boston	12
1916	Gunning, Thomas Francis	Fall River	19
1917	Guy, Walter Bryant	Roxbury	10
1916	Halton, Edward Peter	Springfield	2
1917	Hanson, William Greene	Everett	10
1917	Harnett, Edward Henry Lewis	Dorchester	12
1917	Hill, Ernest Linwood	Millis	14

Year of Admission.	Name.	Residence.	Medical College.
1916	Holzman, Joseph	Roxbury	37
1917	Hopkins, Ralph Harrison	Boston	10
1917	Howard, Charles Tilden	Boston	10
1917	Howe, Winfred Lewis	Everett	12
1917	Howes, Willard Boyden	Rutland	10
1917	Hudson, Carl Bibb	East Boston	11
1916	Hughes, Edgar Hamill	Northampton.	28
1916	Hyde, Harold Valmore	Boston	11
1917	Ingoldsby, Joseph Emmanuel	Dorchester	11
1917	Irving, Harry Washington	Boston	12
1917	Jewett, Howard Wakefield	Lowell	21
1916	Kandib, Anna Hilda	Danvers	12
1917	Kane, William Vincent	Lynn	12
1916	Keenan, James Alphonsus	Boston	12
1917	Kelley, Eugene Robert	Boston	6
1916	Kelley, Henry Joseph	Dorchester	22
1916	Kewer, Leo Thomas	Waverley	12
1917	Khoury, Kamel	Worcester	40
1916	Koplin, Harry	Springfield	12
1917	Lacey, Walter Hamer	Boston	11
1917	La Liberté, Elie Joseph	Fall River	12
1916	Lawlor, John Charles	South Boston	11
1916	Lawlor, James Francis	Beverly	22
1916	Lazarus, Louis	Worcester	11
1916	Ledbury, John William	Uxbridge	7
1916	Leith, Richard Bliss	Lawrence	12
1916	Levine, Harry Benjamin	Roxbury	12
1916	Little, George Thomas	Uxbridge	11
1917	Lawrence, Joseph Louis	Roxbury	11
1916	Lovesey, Burton Edward	Lowell	24
1916	MacGray, Charles Leverne	Needham	12
1917	MacIntyre, William Angus	Grafton	12
1917	Mahoney, John Lewis	Boston	10
1916	Manoogian, Byzant John	Peabody	10
1916	Margeson, Reginald Dimock	Boston	12
1917	Martin, George Forrest	Lowell	31
1916	May, James Vance	North Grafton	19
1916	McCartin, John Edward	Dorchester	12
1917	McWilliams, Norman Beattie	Williamstown	17
1917	Meredith, Florence Lyndon	Watertown	12
1916	Mernin, Mary Towler	Cambridge	12
1917	Merrill, Clyde Harold	Marlborough	5
1916	Miniter, Francis Gabriel	New York City	12
1916	Montague, Charles Elbert	Wakefield	10
1917	Moriarty, John Joseph	Danvers	12
1916	Muldoon, Mary Theresa	Somerville	12
1917	Murphy, Harold Alphonsus	Jamaica Plain	12
1916	Newton, Frank Loomis Sabin	Somerville	10
1917	Niles, John Otis Garfield	Everett	11
1916	Nissen, Harry Archibald	Boston	11
1916	Norris, Rolf Clarke	Methuen	14
1917	Noyes, Arthur Perry	Roxbury	19
1917	Nutt, Walter Elwyn	Methuen	36
1917	O'Brien, John Charles	Greenfield	22
1917	O'Brien, John Charles, Jr.	Greenfield	12
1916	Odeneal, Thomas Helm	Tewksbury	23
1917	Osman, Charles Franklin	Dorchester	11
1917	Overholser, Winfred	Boston	10
1916	Packard, Fabyan	Boston	11
1917	Paglia, Jeremiah James	Worcester	12
1916	Parris, Roland Oliver	Brookline	10
1916	Peck, Martin William	Lynn	11
1917	Pollock, Henry Meeker	Boston	33
1916	Porter, Charles Terrell	Boston	35
1917	Quennell, Willard Leslie	Cambridge	12
	(Readmitted by Censors)		
1916	Quinn, James Henry	Springfield	4
1917	Rafferty, Thomas Bernard	Lynn	12
1917	Reed, Carlisle	Boston	11
1916	Reeves, Marcellus	Boston	11
1917	Riordan, Arthur Hatton	Springfield	32
1916	Ruble, Wells Allen	Melrose	13
1916	Saltz, Sidney Meyer	Boston	32
1917	Salvin, Louis Wilton	Roxbury	10
1917	Scanlon, Joseph Michael	Lawrence	12
1916	Scarito, Nicholas Julius	Lawrence	3
1917	Sedgley, Frank Robert	West Roxbury	10
1917	Seibels, Robert Emmett	Springfield	17
1916	Shain, Arthur Irving	Roxbury	11
1916	Sheehan, Edward Bernard	Roxbury,	11
1917	Shields, Warren Sylvester	Boston	11
1916	Shinn, Philip Allen	Gloucester	12
1916	Silver, Louis Serebriany	Malden	12
1917	Skirball, Joseph Jacob	Boston	12
1916	Smith, Edwin Eugene	Quincy	12
1917	Smith-Petersen, Marius Nygaard	Boston	11
1917	Sowles, Horace Kennedy	Boston	11
1917	Streeter, Howard Alvertus	Pittsfield	10
1917	Swaim, Loring Tiffany	Cambridge	11
1917	Thompson, Herbert Ellery	Worcester	5
1916	Thompson, William James	Danvers	15
1916	Tobey, Harold Grant	Boston	11
1917	Towle, Fred Scates	Portsmouth, N. H.	17
1917	Trask, Harry Wallis	West Boylston	22
1917	Van Deursen, George Livesay	Lowell	21
1916	Van Gaasbeek, George Henry	Springfield	15
1917	Vivian, William James	East Walpole	14
1916	Voorhis, Kathalyn	Worcester	12
1916	Wadden, Joseph Matthew	Cambridge	12
1917	Wallace, John	Roxbury	41
1917	Warren, Charles Fletcher	Amesbury	11
1916	Waters, James Edward	Gardner	8
1916	Whitman, Luther Oakes	Amherst	9
	(Readmitted by Censors)		
1917	Williamson, Cordelia Isabella	Watertown	12
1917	Withington, Paul Richmond	Boston	11
1916	Zarrella, Angelo Mario	Lynn	12

Total. 165+2.=167

Key to Medical Colleges.

2	Yale University, Medical Department.
3	George Washington University, Department of Medicine.
4	Georgetown University School of Medicine.
5	Medical School of Maine.
6	Johns Hopkins University, Medical Department.
7	College of Physicians and Surgeons, Baltimore, Maryland.
8	Baltimore Medical College.
9	University of the South.
10	Boston University School of Medicine.
11	Medical School of Harvard University.
12	Tufts College Medical School.
13	American Medical Missionary College.
14	Dartmouth Medical School.
15	Albany Medical College.
16	Long Island College Hospital.
17	Columbia University College of Physicians and Surgeons.
19	University of Pennsylvania, Department of Medicine.
21	Hahnemann Medical College and Hospital of Philadelphia.
22	University of Vermont, Medical Department.
23	Medical Department of the Tulane University of Louisiana.
24	Medico-Chirurgical College of Philadelphia.
25	College of Physicians and Surgeons, Keokuk, Iowa.
26	McGill University, Medical Faculty.
27	Medical College of the University of Cincinnati.
28	Fordham University School of Medicine.
29	University of Georgia, Medical Department.
31	New York Homeopathic Medical College and Flower Hospital.
32	University of Maryland, School of Medicine.
33	University of Minnesota, College of Medicine and Surgery.
35	Medical College of Virginia.
36	Baltimore University School of Medicine.
37	College of Physicians and Surgeons, Chicago, Illinois
39	Halifax Medical College.
40	L'École de Médecine de Beyrouth
41	Royal College of Surgeons, Edinburgh, Scotland
42	Hahnemann Medical College and Hospital of Chicago.

OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY.

Chosen by the Council, June 12, 1917.

Samuel B. Woodward, Worcester, President.
George P. Twitchell, Greenfield, Vice-president.
Walter L. Burrage, Boston, Secretary.
Arthur K. Stone, Boston, Treasurer.
Edwin H. Brigham, Brookline, Librarian.

STANDING COMMITEES.

Of Arrangements.—J. H. Young, J. L. Huntington, R. H. Miller, C. H. Lawrence, Jr., Donald Macomber, A. W. Reggio.

On Publications and Scientific Papers.—G. B. Shattuck, E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green.

On Membership and Finance.—C. M. Green, A. Coolidge, Jr., Samuel Crowell, F. W. Taylor, Alfred Worcester.

On Ethics and Discipline.—J. A. Gage, J. W. Bartol, Henry Jackson, T. J. Robinson, David Cheever.

On Medical Education and Medical Diplomas.—H. C. Ernst, C. F. Painter, H. W. Newhall, J. F. Burnham, C. Frothingham, Jr.

On State and National Legislation.—S. B. Woodward, F. G. Wheatley, W. P. Bowers, W. H. Robey, Jr., J. S. Stone.

On Public Health—E. H. Bigelow, W. I. Clark, Annie L. Hamilton, R. I. Lee, E. F. Cody.

PRESIDENTS OF DISTRICT MEDICAL SOCIETIES.

Vice-Presidents (*Ex-Officiis*).

Arranged according to seniority of fellowship in the Massachusetts Medical Society.

G. T. Tuttle	Middlesex South
H. F. Vickery	Suffolk
W. P. Lawler	Middlesex North
N. K. Noyes	Plymouth
M. F. Fallon	Worcester
J. H. Ash	Norfolk South
E. G. Fosgate	Worcester North
A. G. Minshall	Hampshire
T. R. Healy	Essex North
H. A. Gale	Middlesex East
J. C. Pitta	Bristol South
W. H. Allen	Bristol North
P. P. Johnson	Essex South
E. S. Osborne	Barnstable
H. N. Howe	Franklin
A. C. Merrill	Berkshire
F. W. Sleeper	Norfolk
J. M. Birnie	Hampden

COUNCILORS, 1917-1918.

Note.—The initials M. N. C., following the name of a councilor, indicate that he is a member of the Nominating Committee. V.P. indicates that a member is a councilor by virtue of his office of president of a district society, and so vice-president of the general society. C. indicates that he is chairman of a Standing Committee. Ex-P. indicates ex-president.

Barnstable.
E. S. Osborne, V.P., West Dennis.
C. W. Milliken, M.N.C., Barnstable.
J. P. Nickerson, West Harwich.

Berkshire.
A. P. Merrill, V.P., Pittsfield.
C. S. Chapin, Great Barrington.
Henry Colt, Pittsfield.
W. W. Jones, Housatonic.
J. W. Riley, M.N.C., North Adams.

Bristol North.
W. H. Allen, V.P., Mansfield.
A. B. Goss, Taunton.
W. O. Hewitt, Attleborough.
F. A. Hubbard, M.N.C., Taunton.
S. D. Presbrey, Ex-P., Taunton.

Bristol South.
J. C. Pitta, V.P., New Bedford.
E. F. Cody, New Bedford.
C. F. Connor, M.N.C., New Bedford.
E. F. Curry, Fall River.
A. B. Cushman, South Dartmouth.
W. A. Dolan, Fall River.
R. W. Jackson, Fall River.
A. H. Mandell, New Bedford.

Essex North.
T. R. Healy, V.P., Newburyport.
J. Q. Adams, Amesbury.
G. M. Atwood, Bradford.
R. V. Baketel, Methuen.
I. J. Clarke, Haverhill.
G. E. Kurth, Lawrence.
E. H. Noyes, Newburyport.
J. J. O'Sullivan, Lawrence.
F. W. Snow, M.N.C., Newburyport.

Essex South.
P. P. Johnson, V.P., Beverly.
C. H. Bangs, Lynn.
R. E. Bicknell, Swampscott.
N. P. Breed, Lynn.
D. J. Finegan, Gloucester.
H. K. Foster, Peabody.
W. T. Hopkins, Lynn.
J. B. Macdonald, Danvers (Hathorne).
P. P. Moore, Gloucester.
W. G. Phippen, Salem.
Emile Poirier, M.N.C., Salem.
H. E. Sears, Beverly.
R. E. Stone, Beverly.

Franklin.
H. N. Howe, V.P., Greenfield.
G. P. Twitchell, M.N.C., Greenfield.
N. P. Wood, Northfield.

Hampden.
J. M. Birnie, V.P., Springfield.
T. S. Bacon, Springfield.
E. P. Bagg, Jr., Holyoke.
J. J. Carroll, Holyoke.
L. D. Chapin, Springfield.
P. M. Cort, Springfield.
A. C. Eastman, Springfield.
R. A. Greene, Monson.
E. A. Knowlton, Holyoke.
L. E. Mannix, Chicopee.
R. B. Ober, Springfield.
A. G. Rice, Springfield.
G. L. Schadt, Springfield.
H. W. Van Allen, M.N.C., Springfield.

Hampshire.
A. G. Minshall, V.P., Northampton.
C. A. Byrne, Hatfield.
J. S. Hitchcock, M.N.C., Northampton.
F. H. Smith, Hadley.

Middlesex East.
H. A. Gale, V.P., Winchester.
J. W. Heath, M.N.C., Wakefield.
E. S. Jack, Melrose.
W. H. Keleher, Woburn.
G. N. P. Mead, Winchester.

Middlesex North.
W. P. Lawler, V.P., Lowell.
J. A. Gage, C., Lowell.
A. R. Gardner, Lowell.
W. B. Jackson, M.N.C., Lowell.
J. H. Lambert, Lowell.
G. O. Lavalée, Lowell.
E. G. Livingston, Lowell.
M. A. Tighe, Lowell.

Middlesex South.
G. T. Tuttle, V.P., Waverley.
E. S. Abbot, Waverley.
H. T. Baldwin, Chestnut Hill.
S. O. Baldwin, Framingham.
F. E. Bateman, Somerville.
E. H. Bigelow, C., Framingham.
C. H. Cook, Natick.
E. A. Darling, Cambridge.
D. C. Dow, Cambridge.
A. W. Dudley, Cambridge.
John Duff, Charlestown.
W. E. Fernald, Waverley.
G. W. Gay, Ex-P., Chestnut Hill.
C. M. Hutchinson, Cambridge.
A. A. Jackson, Everett.
Edward Mellus, Newton.
C. E. Mongan, Somerville.
C. E. Prior, Malden.
W. A. Putnam, Cambridge.
Godfrey Ryder, Malden.
L. F. Sise, Medford.
Joseph Stanton, Brighton.
E. H. Stevens, M.N.C., Cambridge.
F. R. Stubbs, Newton
Julia Tolman, Arlington.
H. P. Walcott, Ex-P., Cambridge.
C. T. Warner, Marlborough.
G. W. Whiting, Somerville.
Alfred Worcester, Waltham.
J. H. Young, C., Newton.

Norfolk.
F. W. Sleeper, V.P., Dorchester.
J. W. Bail, Brookline.
W. W. Barker, Dorchester.
W. H. Bennett, Hyde Park.
E. H. Brigham, L., Brookline.
A. N. Broughton, Jamaica Plain.
T. J. Coyne, Roxbury.
S. F. Curran, Dorchester.
H. W. Dana, Brookline.
H. M. Emmons, Jamaica Plain.
H. C. Ernst, C., Jamaica Plain.
C. B. Faunce, Jamaica Plain.
T. F. Greene, Roxbury.
R. W. Hastings, Brookline.
G. W. Kaan, Brookline.
Bradford Kent, Dorchester.
W. C. Kite, Milton.
Joseph Kittredge, Brookline.
W. A. Lane, Milton.
Louis Mendelsohn, Dorchester.
E. F. Murphy, Roxbury.
T. J. Murphy, M.N.C., Roxbury.
A. P. Perry, Jamaica Plain.
J. W. Pratt, Dedham.
J. A. Reilly, Dorchester.
S. H. Rubin, Roxbury.
Victor Safford, Jamaica Plain.
R. D. Schmidt, Dorchester.
C. E. Shaw, Roxbury.
H. F. R. Watts, Dorchester.

Norfolk South.
J. H. Ash, V.P., Quincy.
C. S. Adams, Wollaston.
F. R. Burke, Quincy.
G. H. Ryder, M.N.C., Quincy.

Plymouth.
N. K. Noyes, V.P., Duxbury.
A. A. MacKeen, Whitman.
Gilman Osgood, Rockland.
A. E. Paine, M.N.C., Brockton.
F. J. Ripley, Brockton.
F. G. Wheatley, Brockton.

Suffolk.
H. F. Vickery, V.P., Boston.
E. S. Boland, South Boston.
H. I. Bowditch, Brookline.
G. W. W. Brewster, M.N.C., Boston.
W. L. Burrage, S., Boston.
A. L. Chute, Boston.
E. A. Codman, Boston.
J. A. Cogan, Boston.
F. J. Cotton, Boston.
G. A. Craigin, Boston.
E. G. Cutler, Boston.
R. L. DeNormandie, Boston.
Albert Ehrenfried, Boston.
Channing Frothingham, Boston.
C. M. Green, C., Boston.
J. B. Hawes, 2d, Boston.
W. C. Howe, Boston.
H. T. Hutchins, Boston.
Henry Jackson, Boston.
R. W. Lovett, Boston.
W. A. Morrison, East Boston.
J. L. Morse, Boston.
Abner Post, Boston.
Anna G. Richardson, Boston.
W. H. Robey, Jr., Boston.
D. D. Scannell, Boston.
G. G. Sears, Boston.
G. B. Shattuck, C., Boston.
G. C. Smith, Boston.
G. G. Smith, Boston..
Mary A. Smith, Boston.
P. M. Smith, Boston.
R. M. Smith, Boston.
A. K. Stone, T., Boston.
F. B. Talbot, Boston.
D. H. Walker, Boston.
John Warren, Boston.

Worcester.
M. F. Fallon, V.P., Worcester.
F. H. Baker, Worcester.
W. P. Bowers, Ex-P., Clinton.
F. H. Clapp, North Grafton.
W. J. Delahanty, Worcester.
J. T. Duggan, Worcester.
Homer Gage, Worcester.
J. O. Genereux, Webster.
R. W. Greene, Worcester.
David Harrower, M.N.C., Worcester.
A. G. Hurd, Millbury.
W. L. Johnson, Uxbridge.
G. O. Ward, Worcester.
F. H. Washburn, Holden.
C. D. Wheeler, Worcester.
S. B. Woodward, P., Worcester.

Worcester North.
E. G. Fosgate, V.P., Ashburnham
J. G. Henry, Winchendon.
A. P. Mason, M.N.C., Fitchburg.
E. A. Sawyer, Gardner.
A. A. Wheeler, Leominster.

CENSORS, 1917-1918

Barnstable.
C. E. Harris, Hyannis
S. F. Haskins, Cotuit
J. H. Higgins, Marston's Mills
W. D. Kinney, Osterville
C. W. Milliken, Supervisor, Hyannis.

Berkshire,
W. E. Brown, North Adams.
Henry Colt, Supervisor, Pittsfield.
William Galvin, Blackinton.
A. C. England, Pittsfield.
G. P. Hunt, Pittsfield.

Bristol North,
H. B. Baker, Dighton.
T. F. Clark, Taunton.
E. J. Galligan, Taunton.
F. A. Hubbard, Supervisor, Taunton.
T. J. Robinson, Taunton.

Bristol South,
W. A. Dolan, Supervisor, Fall River.
J. G. Hathaway, New Bedford.
W. T. Learned, Fall River.
C. J. Leary, New Bedford.
I. N. Tilden, Mattapoisett.

Essex North,
J. E. Bryant, Haverhill.
H. L. Conner, Haverhill.
R. C. Hurd, Newburyport.
J. J. O'Sullivan, Supervisor, Lawrence.
F. D. McAllister, Lawrence.

Essex South,
J. A. Bedard, Lynn.
L. Grimes, Swampscott.
W. G. Phippen, Supervisor, Salem.
B. F. Sturgis, Salem.
J. W. Trask, Lynn.

Franklin,
E. G. Best, Greenfield.
J. W. Cram, Colrain.
C. C. Messer, Turner's Falls.
G. P. Twitchell, Supervisor, Greenfield.
C. L. Upton, Greenfield.

Hampden,
T. S. Bacon, Supervisor, Springfield.
M. W. Harrington, Springfield.
G. D. Henderson, Holyoke.
Michael O'Shea, Chicopee.
G. L. Woods, Springfield.

Hampshire,
W. J. Adams, Northampton.
C. A. Byrne, Supervisor, Hatfield.
C. T. Cobb, Northampton.
W. J. Collins, Northampton.
J. E. Hayes, Northampton.

Middlesex East,
G. F. Dow, Reading.
E. S. Jack, Supervisor, Melrose,
G. W. Nickerson, Stoneham.
J. A. O'Leary, Wakefield.
C. E. Ordway, Winchester.

Middlesex North,
G. E. Caisse, Lowell.
E. J. Clark, Lowell.
J. H. Lambert, Supervisor, Lowell.
J. P. McAdams, Lowell.
E. J. Welch, Lowell.

Middlesex South,
E. S. Abbot, Supervisor, Waverley.
F. J. Goodridge, Cambridge.
C. E. Hills, South Natick.
F. L. Morse, Somerville.
F. W. Rice, Brighton.

Norfolk,
M. J. Cronin, Roxbury.
F. P. Denny, Brookline.
W. C. Kite, Supervisor, Milton.
J. C. Stedman, Jamaica Plain.

Norfolk South.
K. H. Granger, South Weymouth.
C. H. Gould, Braintree.
C. J. Lynch, Quincy.
J. A. Peterson, Hingham.
G. H. Ryder, Supervisor, Quincy.

Plymouth,
J. H. Drohan, Brockton.
Joseph Frame, Rockland.
W. W. Fullerton, Brockton.
R. B. Rand, North Abington.
F. J. Ripley, Supervisor, Brockton.

Suffolk,
J. W. Cummin, Boston,
C. N. Cutler, Chelsea.
H. W. Goodall, Boston.
W. C. Howe, Boston.
W. H. Robey, Jr., Supervisor, Boston.

Worcester,
W. E. Denning, Worcester.
D. F. O'Connor, Worcester.
W. C. Seelye, Worcester.
C. B. Stevens, Worcester.
F. H. Washburn, Supervisor, Holden.

Worcester, North.
B. H. Hopkins, Ayer.
A. P. Lowell, Fitchburg.
A. P. Mason, Supervisor, Fitchburg.
H. R. Nye, Leominster.
W. F. Robie, Baldwinsville.

COMMISSIONERS OF TRIALS.

1917-1918.

Barnstable, W. D. Kinney, Osterville.
Berkshire, H. B. Holmes, Adams.
Bristol North, C. S. Holden, Attleborough.
Bristol South, W. E. Synan, Fall River.
Essex North, J. F. Croston, Haverhill.
Essex South, J. E. Simpson, Salem.
Franklin, F. E. Johnson, Erving.
Hampden, F. H. Allen, Holyoke.
Hampshire, M. W. Pierson, Ware.
Middlesex East, C. W. Harlow, Melrose Highlands.
Middlesex North, F. E. Varney, North Chelmsford.
Middlesex South, L. M. Palmer, Framingham.
Norfolk, A. P. Perry, Jamaica Plain.
Norfolk South, N. S. Hunting, Quincy.
Plymouth, F. J. Hanley, Whitman.
Suffolk, F. B. Lund, Boston.
Worcester, G. F. Hart, Webster.
Worcester North, F. H. Thompson, Fitchburg.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES.

1917-1918.

Barnstable.—E. S. Osborne, West Dennis, President; F. A. Binford, Hyannis, Vice-President; P. F. Miller, Harwich, Secretary; H. B. Hart, Yarmouthport, Treasurer; S. M. Beale, Jr., Sandwich, Librarian.

Berkshire.—A. P. Merrill, Pittsfield, President; Vanderpoel Adriance, Williamstown, Vice-President; O. L. Bartlett, Pittsfield, Secretary; J. D. Howe, Pittsfield, Treasurer.

Bristol North.—W. H. Allen, Mansfield, President; H. G. Ripley, Taunton, Vice-President; A. R. Crandell, Taunton, Secretary; W. Y. Fox, Taunton, Treasurer.

Bristol South.—J. C. Pitta, New Bedford, President; J. A. Barre, Fall River, Vice-President; A. J. Abbe, Fall River, Secretary and Treasurer.

Essex North.—T. R. Healy, Newburyport, President; F. E. Sweetsir, Merrimac, Vice-President; J. F. Burnham, Lawrence, Secretary and Treasurer.

Essex South.—P. P. Johnson, Beverly, President; J. F. Jordan, Peabody, Vice-President; H. P. Bennett, Lynn, Secretary; G. Z. Goodell, Salem, Treasurer; C. M. Cobb, Lynn, Librarian.

Franklin.—H. N. Howe, Greenfield, President; Charles Moline, Sunderland, Vice-President; F. A. Millett, Greenfield, Secretary and Treasurer.

Hampden.—J. M. Birnie, Springfield, President; M. B. Hodskins, Monson, Vice-President; H. L. Smith, Springfield, Secretary and Treasurer.

Hampshire.—A. G. Minshall, Northampton, President; A. G. Rockwell, Amherst, Vice-President; J. D. Collins, Northampton, Secretary; J. J. Hanson, Northampton, Treasurer; F. E. Dow, Northampton, Librarian.

Middlesex East.—H. A. Gale, Winchester, President; M. D. Sheehan, Stoneham, Vice-President; A. E. Small, Melrose, Secretary; Richard Dutton, Wakefield, Treasurer; G. W. Nickerson, Stoneham, Librarian.

Middlesex North.—W. P. Lawler, Lowell, President; G. H. A. Leahey, Lowell, Vice-President; J. A. Mehan, Lowell, Secretary; T. B. Smith, Lowell, Treasurer; P. J. Meehan, Lowell, Librarian.

Middlesex South.—G. T. Tuttle, Waverley, President; H. T. Baldwin, Chestnut Hill, Vice-President; L. S. Hapgood, Cambridge, Secretary; F. W. Plummer, Malden, Treasurer.

Norfolk.—F. W. Sleeper, Dorchester, President; E. N. Libby, Jamaica Plain, Vice-President; Bradford Kent, Dorchester, Secretary; G. W. Kaan, Brookline, Treasurer.

Norfolk South.—J. H. Ash, Quincy, President; E. N. Bushnell, Quincy, Vice-President; F. H. Merriam, Braintree, Secretary, Treasurer and Librarian.

Plymouth.—N. K. Noyes, Duxbury, President; Gilman Osgood, Rockland, Vice-President; A. C. Smith, Brockton, Secretary, Treasurer and Librarian.

Suffolk.—H. F. Vickery, Boston, President; J. B. Blake, Boston, Vice-President; G. G. Smith, Boston, Secretary; E. B. Young, Boston, Treasurer; W. P. Coues, Boston, Librarian.

Worcester.—M. F. Fallon, Worcester, President; W. L. Johnson, Uxbridge, Vice-President; E. L. Hunt, Worcester, Secretary; G. O. Ward, Worcester, Treasurer; G. C. Lincoln, Worcester, Librarian.

Worcester North.—E. G. Fosgate, Ashburnham, President; A. H. Pierce, Leominster, Vice-President; C. H. Jennings, Fitchburg, Secretary; F. H. Thompson, Jr., Fitchburg, Treasurer; A. P. Mason, Fitchburg, Librarian.

List of Presidents of the Massachusetts Medical Society—1782-1917

*Edward Augustus Holyoke	1782-1784
*William Kneeland	1784-1786
*Edward Augustus Holyoke	1786-1787
*Cotton Tufts	1787-1795
*Samuel Danforth	1795-1798
*Isaac Rand	1798-1804
*John Warren	1804-1815
*Joshua Fisher	1815-1823
*John Brooks	1823-1825
*James Jackson	1825-1832
*John Collins Warren	1832-1836
*George Cheyne Shattuck	1836-1840
*Rufus Wyman	1840-1842
*Jacob Bigelow	1842-1847
*Zadok Howe	1847-1848
*John Ware	1848-1852
*George Hayward	1852-1855
*Elisha Huntington	1855-1857
*Luther V Bell	1857-1859
*John Homans	1859-1862
*Josiah Bartlett	1862-1864
*Augustus Addison Gould	1864-1866
*Henry Coit Perkins	1866-1868
*Charles Gideon Putnam	1868-1870
*Samuel Augustus Fisk	1870-1872
*George Cheyne Shattuck	1872-1874
*Benjamin Eddy Cotting	1874-1876
*William Cogswell	1876-1878
*George Hinckley Lyman	1878-1880
*Henry Willard Williams	1880-1882
*Alfred Hosmer	1882-1884
*Charles Dudley Homans	1884-1886
*Thomas Hovey Gage	1886-1888
*David Williams Cheever	1888-1890
*Amos Howe Johnson	1890-1892
*James Clarke White	1892-1894
*Franklin Kittredge Paddock	1894-1896
Henry Pickering Walcott	1896-1898
*Edwin Bayard Harvey	1898-1900
*Frank Winthrop Draper	1900-1902
*George Ebenezer Francis	1902-1904
*Arthur Tracy Cabot	1904-1906
George Washington Gay	1906-1908
Silas Dean Presbrey	1908-1910
George Brune Shattuck	1910-1912
Walter Prentice Bowers	1912-1914
*Charles Francis Withington	1914-1916
Samuel Bayard Woodward	1916-

* Deceased.

THE MASSACHUSETTS MEDICAL SOCIETY.

Franklin District Medical Society.—The next meeting of the Franklin District Medical Society will be held at the Mansion House, Greenfield, July 10, 1917, at 11.15 a.m.

Papers

The Management of Labor.
Dr. George P. Twitchell, Greenfield.
Ear Complications of Infectious Diseases, with Case Reports. Dr. Frank A. Millett, Greenfield.

Frank A. Millett, *Secretary.*

Miscellany.

APPOINTMENTS.

California State Board of Health:—*Professor Charles A Kofoid*, professor of zoölogy in the University of California, and his assistant, *Professor* W. W. *Cort*, have been appointed to the California State Board of Health. Provision has been made for the establishment of a biological laboratory for protozoological and helminthological work in conjunction with the Bureau of Communicable Diseases.

RECENT DEATHS.

Ferdinand A. Stillings, M.D., of Concord, N. H., died at his home on June 22nd. He was born in Lancaster, N. H., on March 30, 1849. He had served as surgeon-general on the staffs of Governors Hiram Tuttle and Frank W. Rollins and had been president of the New Hampshire Medical Society. He was a member of the American College of Surgeons and other medical societies.

Lieut.-Col. George D. Deshon, U. S. A., chief surgeon on the staff of Brig.-Gen. Clarence R. Edwards of the Department of the Northeast, died on June 24 in Brookline, Mass. Lieut.-Col Deshon was born in 1865 He had medical degrees from Dartmouth, Bellevue Medical College and the University of Pennsylvania, and had served in the Cuban and Philippine campaigns and was a department surgeon to Gen. Edwards at Panama He is survived by a widow and a son

The Boston Medical and Surgical Journal

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Original Articles.

AN ANALYSIS OF 133 FRACTURES OF THE SPINE TREATED AT THE MASSACHUSETTS GENERAL HOSPITAL.

By John B. Hartwell, M.D., Boston.

The data upon which this report is based were obtained from the records of 133 patients who were treated for fracture of the spine at the Massachusetts General Hospital between January 1, 1900, and December 31, 1914. To the members of the staff* of the hospital under whose care the patients came, I am indebted for the opportunity of making this analysis.

The report deals with 7 women and 126 men, the majority of them in the prime of life, who met with accidents which resulted in fracture of the vertebrae alone, or in combination with other injuries, and directly or indirectly caused death in 59 instances.

Ages by Decades	
10-19	7
20-29	37
30-39	40
40-49	26
Over 50	21
Age not noted	2
	133

The type of accident which produced the injuries is shown in the following table:

Falls from a height		83
Jack knifed by falling weight	11	
Jack knifed by low bridge	6	
Jack knifed by cave-in	1	
Jack knifed by diving	5	
Jack knifed by football	1	
Jack knifed by coasting	1	25
Collision with trains	8	
Collision with automobile	1	9
Direct blows		7
Alighting from moving cars		2
No history obtained		7
		133

A study of the histories of the accidents, as given by the patients, in this series allows no general conclusion to be drawn as to the mechanism of the fracture of the spine. There is no reasonable doubt that in the jack-knifing accidents the immediate cause of fracture was hyperflexion of the spine, and a similar factor may be assumed to have been the causative means in the 83 patients who fell from a height, but this cannot be proven from the accounts given by the injured themselves. Thus 22 stated that they landed on their head and shoulders, 4 on their shoulders, 10 flat on their back, 4 on their buttocks, and 4 on their feet, while 39 were unable to state how they landed; but of the 22 who landed on their head and shoulders, 8 stated that the fall rendered them unconscious for varying periods; 1 was walking in his sleep when the accident occurred, and 1 was so intoxicated that the fact that he landed on his head was the only detail of the accident he could give. Similar discrepancies are found in the records of the remaining 22 patients who made positive statements as to the manner of landing.

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* The patients were under the care of the following present and past members of the staff: Dr. F. G. Balch, Dr. H. H. A. Beach (deceased), Dr. G. W. W. Brewster, Dr. W. A. Brooks, Dr. A. T. Cabot (deceased), Dr. Hugh Cabot, Dr. Farrar Cobb, Dr. E. A. Codman, Dr. W. M. Conant, Dr. Lincoln Davis, Dr. J. W. Elliott, Dr. R. B. Greenough, Dr. F. B. Harrington (deceased), Dr. J. B. Hartwell, Dr. John Homans, Dr. D. F. Jones, Dr. S. J. Mixter, Dr. W. J. Mixter, Dr. J. G. Mumford (deceased), Dr. F. T. Murphy, Dr. C. A. Porter, Dr. C. B. Porter (deceased), Dr. C. L. Scudder, Dr. M. H. Richardson (deceased), Dr. J. C. Warren, Dr. Hugh Williams.

The regions injured by the different types of accident are shown in the following table:

	INJURED REGION		
	CERVICAL	DORSAL	LUMBAR
Falls from a height	31	30[1]	22
Jack knifed by falling weights	3[2]	5	3
Jack knifed by low bridge	8	2	1
Jack knifed by cave-in	0	1	0
Jack knifed by diving	4	1	0
Jack knifed by football accident	1	0	0
Jack knifed by coasting accident	0	1	0
Collision with trains	3	2	3
Collision with automobiles	0	0	1
Direct blows	0	5	2
Alighting from moving cars	0	1	1
No history obtained	4	3	0
	49	51	33

All told, this series contains:

Fracture in the cervical region	48
Fracture in the cervical and dorsal regions	1
Fracture in the dorsal region	50
Fracture in the dorsal and lumbar regions	1
Fracture in lumbar region	33
	133

Of 49 instances of fracture in the cervical region, there were broken singly or in combination:

1st vertebra	0	
2d vertebra	1	
3d vertebra	7	
4th vertebra	14	62
5th vertebra	29	
6th vertebra	19	
7th vertebra	6	
	76	

62 of 76 fractures in the cervical region, suffered by 49 patients, involved the fourth, fifth and sixth vertebrae alone or in combination.

51 patients suffered fractures of the dorsal spine as follows:

1st vertebra	1	16
2d vertebra	3	
3d vertebra	7	
4th vertebra	5	
5th vertebra	1	13
6th vertebra	2	
7th vertebra	4	
8th vertebra	6	
9th vertebra	3	37
10th vertebra	9	
11th vertebra	8	
12th vertebra	17	
	66	

If the dorsal spine be divided into thirds, there were fractures of the bones of the upper third in 16 instances, of the middle third in 13 instances, and of the lowest third in 37 instances, or more frequently than the other two segments combined.

34 patients presented fractures of the lumbar spine, as follows:

1st vertebra	20
2d vertebra	8
3d vertebra	1
4th vertebra	3
5th vertebra	4
Unspecified	4
	40

These tables confirm the accepted view that there are two regions of the spine especially likely to suffer fracture, the mid-cervical and the dorso-lumbar. In the former situation the fourth, fifth and sixth vertebrae are the vulnerable ones, and in the latter situation the tenth, eleventh and twelfth dorsal and first lumbar.

In this series, isolated fractures of the vertebral processes seem rare: only seven are recorded; five of transverse process, and one each of spinous process and articular process. As is to be expected, these process fractures all occurred in the lumbar region, where the transverse processes are long and slender, not short and thick, as in the cervical region, nor protected by fragile ribs, as in the dorsal region. The spinous processes in the lumbar region are, likewise, less protected than in either the cervical or dorsal segments of the spine, where the imbrication of the spinous processes allows any trauma to be borne by several, and not by an isolated process.

Process fractures in this series resulted from direct trauma, in contradistinction to the body fractures, a certain proportion of which are certainly, and the remainder presumably, dependent on indirect trauma.

In addition to compression fractures of the vertebral bodies and fractures of the vertebral processes, a review of the post-mortem records has shown three cases of fracture of the intervertebral discs, all in the cervical segment of the spine. For access to the necropsy records, the author is indebted to Dr. James Homer Wright, director of the clinico-pathological laboratory of the Massachusetts General Hospital.

In each of the cases the patients on entrance to the hospital had a complete motor and sensory paralysis below the segment of the cord opposite the fractured disc, with abolition of all reflexes, superficial and deep, and retention of urine and feces.

The autopsy protocols in these cases are given in full so far as they relate to the spine, since no text-books examined by the author make mention of isolated fracture of the intervertebral discs.

(1) "Viewed from in front, the third cervical disc is of slightly increased prominence. A V-shaped segment sawed from the front of the column shows discs between third and fourth cervical, and fourth and fifth cervical torn apart and blood-stained. Spinous process of the

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[1] 12th dorsal and 1st lumbar injured.
[2] 7th cervical and 1st dorsal injured.

third cervical abnormally mobile and somewhat separated from that of the fourth cervical. Spinal cord opposite third and fourth cervical flattened and distinctly soft to touch.''

(2) ''Cervical spine from in front shows deformity at level of fourth and fifth segments, characterized by projection forward of the body of the fourth cervical from that of the fifth cervical. Dissection reveals rupture of the fourth disc and adjoining ligaments. From behind, the cervical segment of the spine at the level of the fourth cervical, fragmented. On laminectomy, cord at the level of fracture depressed and softened. Vertebral canal at level of the fourth intervertebral disc interrupted, the column discontinuous, evidently by rupture of the disc and by the ligaments of the spinous processes.''

(3) ''Laminae of fifth and sixth cervical vertebrae are separated from one another by an interval of about 1 cm., and through an opening just to the right of the spinous process, dura is apparent. No fracture of the laminae or spinous process is made out. On removing the cord the anterior surface of the spinal canal, at a point corresponding to the interval between the fifth and sixth cervical vertebrae, is bent backward to form an obtuse angle from the shoving forward of the cervical vertebrae above this point. On section through the cervical vertebrae, the disc between the fifth and sixth cervical is found disintegrated.''

In 41 instances, or 30.8%, the spinal fracture was but one item of the injuries sustained by the patient, as recorded in the records. The nature of these complicating injuries is tabulated below:

	Cervical	Dorsal	Lumbar	Total
Fractured skull	6	4	2	12
Fractured ribs	5	8	3	16
(Punctured lung	1	3	0	4)
Fractured sternum	0	1	2	3
Fractured upper extremity:				
Girdle	2	1	0	3
Arm	1	0	0	1
Forearm	3	3	1	7
Fractured lower extremity:				
Pelvis	0	0	2	2
Thigh	1	2	1	4
Leg	0	1	4	5
Ruptured viscus	1	1	0	2
Hemothorax	0	1	2	3
Ruptured brachial plexus	1	0	0	1
Extensive lacerations	0	3	2	5
	20	25	19	64

The injury most frequently complicating fracture in the cervical region was fractured skull, and a careful study of the records makes skull fracture probable in several instances where this injury is not specifically stated to have been present; in the dorsal region, fracture of the ribs is the most common injury; and complicating fractures of the lumbar spine, fractures of the lower extremity are most frequently noted. Of the seven fractures of the lower extremity noted as complicating injury to the lumbar spine, four were compound fractures. Hemothorax is noted three times, but in no instance was it recognized clinically. Necropsy revealed the condition.

The records of 107 patients who entered the hospital within forty-eight hours of the receipt of their injury is made the basis of the symptomatology of spinal fracture. This 107 includes 40 fractures of the cervical spine, 38 fractures of the dorsal spine, and 29 fractures of the lumbar spine.

Shock is noted in 24 instances: 3 times in cervical fracture, 11 times in dorsal fracture, and 10 times in lumbar fracture. In every instance of shock in fracture of the cervical vertebrae, there were also noted other severe injuries, and this holds true in 10 of the 11 instances of fracture in the dorsal region, and 8 of the 10 fractures in the lumbar region.

The histories of the 3 patients who showed shock without demonstrable injuries other than fracture of the vertebrae are detailed, because in these there is a reasonable doubt that the injury described was the only injury suffered.

One patient is said to have fallen a distance of 20 feet, landing on her head and shoulders, and presented the classical picture of a complete transverse lesion of the cord at the level of the fifth dorsal segment. No note is made of her mental state other than she was in a state of ''considerable shock.'' She responded ''fairly well'' to stimulation, and within twenty-four hours was subjected to laminectomy, and died almost immediately after the operation, respiration failing. No autopsy was permitted.

Of the patients with fracture of the lumbar spine, one fell thirty feet into a vessel hold and landed on his ''right buttock and side.'' He was dazed but able to stand with great difficulty. There were no paralytic symptoms and all his reflexes were normal. Fracture of the transverse process of the fifth lumbar vertebra is the only injury recorded, but does not seem enough to account for shock. The other patient with lumbar fracture was crushed by a falling boiler. He was a man of twenty-five. When seen in the accident room, he was unconscious and in a state of shock. There was no loss of motor power of legs. He died in half an hour, but ''fracture of the fourth and fifth lumbar'' is the only note of the injury. There was no autopsy.

If these three cases can be excepted, no patient with fracture of the spine, uncomplicated by other demonstrable severe injuries, was recorded as in a condition of shock when first seen.

From the data here presented, shock is not to be expected in uncomplicated vertebral fractures, and the presence of shock is indicative of additional injuries.

Neurological signs presented by the patients are shown in the following table:

	Cervical	Dorsal	Lumbar
Complete motor and sensory paralysis, sphincteric retention and absence of reflexes, superficial and deep	13	12	5
Complete motor and sensory paralysis, with sphincteric retention and absence of all reflexes, superficial and deep except the plantar	8	3	0
Complete motor and sensory paralysis with sphincteric retention, but notes on reflexes unsatisfactory	3	2	0
Complete motor and sensory paralysis with retention with presence of deep or superficial reflexes on one or both sides	5	3	0
Incomplete motor or sensory paralysis, sphincteric retention and complete absence of deep and superficial reflexes	0	1	1
Incomplete motor or sensory paralysis, sphincteric retention and complete absence of deep and superficial reflexes, except plantar	0	0	1
Incomplete motor or sensory paralysis with sphincteric retention but with difference in reflexes on two sides	3	0	1
Incomplete motor or sensory paralysis with retention of urine and feces with normal reflexes	0	1	1
Incomplete motor or sensory paralysis with retention of urine and feces with exaggerated reflexes	1	0	0
Incomplete motor or sensory paralysis with retention of urine and feces, but notes on reflexes unsatisfactory	1	1	1
No motor or sensory paralysis and normal reflexes, but sphincteric disturbances present	0	2	4
No motor or sensory paralysis, but sphincteric disturbances present and no note on reflexes	0	1	1
No motor or sensory paralysis, no sphincteric disturbance, but reflexes changed from the normal—diminished	1	2	0
exaggerated	0	1	0
No motor or sensory paralysis, no sphincteric disturbance, and normal reflexes	1	4	11
No motor or sensory paralysis, no sphincteric disturbance, but no notes on reflexes	1	2	0
No notes on paralysis or reflexes	3	3	3

If the presumptive signs of total transverse lesion of the cord are considered to be a total motor and sensory paralysis with abolition of all reflexes, deep and superficial, except the plantar,—below the injured segment,—and if the cases presenting complete paralysis and sphincteric disturbance but in which the record of the reflexes is not complete, be admitted as presenting signs of total destruction of the cord, there are 46, or 43%, of the cases which meet this definition, divided as follows: cervical, 24, or 60%; dorsal, 17, or 44.7%; lumbar, 5, or 17.24%.

Disturbance in sensation or motion, complete or incomplete, with paralyzed sphincters and reflexes present; normal, exaggerated, diminished, or unequal on two sides,—in other words, signs of cord injury, but not of complete destruction,—were present in 21 additional cases (19.6%), divided as follows: cervical, 10, or 25%; dorsal 6, or 15.8%; lumbar, 5, or 17.24%.

In 8, or 7.4%, of cases, sphincteric retention was the only symptom indicative of cord injury. This condition presented in 3, or 8%, of the dorsal cases, and 5, or 17.24%, of the lumbar fractures.

There remain a few cases who presented no neurological symptoms. Included in this number are 3 cases in which no note was made of reflexes, but in which there was no paralysis or sphincteric disturbance, and 9 cases, 3 in each region, in which no mention is made of paralysis or sphincteric disturbance or the condition of the reflexes: cervical, 6, or 15%; dorsal, 12, or 31.6%; lumbar, 14, or 48.3%; a total of 32, or 30%, of the cases.

Signs of severe cord injury were present in 67, or 62.6% of 107 patients seen within forty-eight hours of the receipt of the injury. In 46, or 43%, the signs on first examination pointed to a complete myelitis, and in 21, or 19.6%, the signs were of a partial cord destruction. Eight, or 7.4% of the cases, showed sphincteric disturbance of short duration, while 32, or 30%, presented no signs of medullary trauma. Roughly, two-thirds of the patients showed severe injury to the cord, and one-third presented slight or no signs of cord injury.

If the 3 regions of the spine be studied, the vast majority (85%) of fractures in the cervical region, and over half (59.4%) of the fractures in the dorsal region were accompanied by symptoms of serious damage to the cord, while two-thirds (65.5%) of fractures in the lumbar segment were accompanied by slight or no evidence of medullary trauma.

A fact of great importance is that, of the 67 patients who had signs of cord lesions, in 66 the onset of the paralysis was immediate, and in only 1 was it gradual.

Priapism was noted in 27 cases: cervical, 16; dorsal, 11; lumbar, 0; and with 3 exceptions (1 in the cervical and 2 in the dorsal region) in patients who presented signs of complete destruction of the cord. From these figures, therefore, the presence of priapism should be a bad prognostic sign.

Subjective pain at the site of fracture was conspicuous by the infrequency of its mention,—only 12 times in all; 3 times in fractures involving the cervical spine, 4 times in the dorsal segment and 5 times in the lumbar segment,—and the extent of the cord lesion had no apparent effect on the presence of pain: 6 had complete cord lesion, 2 incomplete cord lesions, and 4 no cord lesions.

Though conclusions based on small figures are frequently erroneous, at least these figures suggest that the lower the site of the fracture the more likely is subjective pain to be prominent. In the present series it was present in 3 instances in 40 fractures in the cervical region, a percentage of 7; in 4 out of 38 in the dorsal region, 10%; and in 5 out of 29 in the lumbar region, or 17%.

The classical local signs of fracture of the long bones—swelling and ecchymosis, localized tenderness, deformity and crepitation—were applied to the present series.

Discoloration, swelling or contusion at the site of fracture are mentioned in 23 instances, or in 21.5% of the cases under consideration: 2 in the cervical region, 17 times in the dorsal region, and 4 times in the lumbar region.

Localized tenderness was noted in 67 instances, or in 62.6% of the cases: 22 times in the cervical region, 26 times in the dorsal region, and 19 times in the lumbar region.

Deformity was noted in 51 instances, or in 47.7% of the cases: in the cervical region 14 times, in the dorsal region 25 times, and in the lumbar region 12 times.

Crepitation was noted in but 8 instances, 7.5%; twice in the cervical region and three each in the dorsal and lumbar regions.

Localized tenderness over the spinous processes of the fractured vertebrae, or just lateral to the spinous processes, is the subjective sign most frequently noted in this series of cases, and the frequency of this sign is underestimated in the figures quoted, for in 7 instances where contusion or hematoma are noted, no note is made of localized tenderness. Moreover, a number of patients were unconscious when the examination was made, and in these cases the presence of tenderness could not be determined. It is, without doubt, fair to venture a general statement that localized tenderness is present in every instance of fracture of the spine. And as a corollary to this, localized tenderness over the spine should always suggest the possibility of fracture.

Fifty-five patients in this series of 133 were given an x-ray examination, with the results shown in the following table:

	Cervical	Dorsal	Lumbar
Patients examined	23	15	17
Fractures demonstrated	12	8	15
Negative	2	2	0
Questionable fracture	5	5	0
Unsatisfactory plates	2	0	1
Interpretation not recorded	2	0	1

Positive evidence of fracture was obtained in a little over one-half of the cervical and dorsal cases, but in the vast majority of the lumbar cases; included in the lumbar cases are 5 cases of fracture of transverse processes and 1 case of fracture of an articular process that, except for x-ray, would have gone unrecognized.

The 4 cases that were reported "negative" were clinically positive. One of the cervical cases had signs of complete and one of incomplete crush of the cord. One of the dorsal cases had signs of a transverse myelitis, and was further proven by operation to have sustained a fracture. The second dorsal case may be open to some question, for the patient presented no neurological symptoms, and the crepitus that was felt on examination might have been crepitus transmitted from a fractured rib which he suffered. This is the only doubtful case in the whole series.

Recent experience has shown that an absolutely satisfactory plate is necessary to make a diagnosis of fracture of the spine, and ofttimes several exposures are necessary before such a plate is secured. And further, the usual antero-posterior views, though the plates be excellent, often do not clearly show a compression fracture that is unmistakable in a lateral view.

Except in the mid-dorsal region, where the scapulae are interposed, and in the low lumbar region, where in like manner the alae of the ilia are interposed, satisfactory lateral views have been obtained.

If repeated exposures had been made in all cases in the present series in which the plates were unsatisfactory, or in which, from the standpoint of the radiographer, the fracture was "questionable," or in which the x-ray and clinical findings were at variance, there can be no doubt that 100% positive findings would have resulted.

Lumbar puncture is not recorded as being done on any of the patients in this series, though it would seem, *a priori* that valuable evidence as to the condition of the cord might be acquired by this means. A study of the meagre data obtainable, however, indicates that conclusions as to the condition of the cord, drawn from the appearance of the cerebrospinal fluid, may be misleading. The character of the cerebrospinal fluid which escaped on opening the dura at operation, was noted in 8 instances: 5 times as bloody and 3 times as clear. All three of the patients whose cerebrospinal fluid was reported as clear presented the clinical signs of a complete transverse myelitis, and were operated upon within twenty-four hours after the receipt of their injury. In 2 of those cases the cord was not demonstrably injured, while in the third it appeared normal until incised, when cord mush was extruded. Two of the cases with bloody cerebrospinal fluid were operated upon within twenty-four hours of the receipt of the injury, one on the third day, one on the fourth day, and one on the fourteenth day after injury. In 4 cases the cord was found at operation to be completely severed, and in one instance no cord injury could be demonstrated, though the man showed clinical evidence of a severe, though not complete lesion of the cord. From these small figures, a bloody cerebrospinal fluid on lumbar puncture may indicate that the cord be lacerated, but clear fluid does not exclude the possibility of severe trauma to the cord.

In this series 40 patients were subjected to operation, 38 to laminectomy and 2 to attempts to remove deformity by manipulation. Of the laminectomies, 11 were in the cervical region, 24 in the dorsal region, and 3 in the lumbar region.

The data obtained by a study of the records of the findings at operation are disappointingly incomplete, and from their study few conclusions can be drawn. In 38 laminectomies spinous processes are noted as fractured in 19 instances, laminae in 18 instances, and the posterior vertebral ligaments in but 2 instances. These figures suggest that in the mechanism of fracture the bodies are first crushed; if the causative flexion is continued the unyielding bony posterior arch yields to the force, before the elastic ligaments are finally ruptured.

Extradural hemorrhage was noted but twice, and then the blood extravasation was small. In one instance the dura is noted as "bruised," and in 2 instances as "lacerated." Subdural hemorrhage is noted twice, but the extent of the hemorrhage is not mentioned.

In 5 cases the dura was not opened. Of the 33 instances in which the dura was opened no note of the character of the cerebrospinal fluid is made in 25; in 5 instances it is noted as bloody and in 3 cases as clear.

The condition of the spinal cord itself is noted in 30 cases. In 12 instances it is noted as "crushed," once as "lacerated," once as "thinned," once as "slightly discolored." In 13 instances there was no demonstrable injury to the cord. In two instances the cord is noted as being "fairly normal in appearance" until it was incised, when in both instances, cord mush was extruded. In the 12 instances in which the cord was noted as crushed, in the one instance of "lacerated" cord, in the one instance of "thinned" cord and in the two instances where the cord appeared "fairly normal until incised," the clinical symptoms pointed to a transverse myelitis. The patient whose cord was "slightly discolored" was also paralyzed completely. Of the 13 instances in which there was no demonstrable injury to the cord, the symptoms pointed to complete destruction of the cord in 8 cases, and to partial destruction in 5 cases. In 2 cases where no lesion of the cord was demonstrated at the time of operation, autopsy proved acute traumatic softening.

These operative findings indicate that extradural and subdural hemorrhages, secondary to spinal fracture, are infrequent, and rarely large enough to account for compression symptoms. In none of the cases here reported could hemorrhage be considered a factor in the production of symptoms. Further, in not a single instance was bone pressure on the cord demonstrated.

Another interesting and significant point is emphasized by the operative findings; that a fairer estimate of the amount of cord injury was possible through the clinical manifestations than by palpation and ocular inspection of the cord. Moreover, it is shown that cord lesions may be demonstrated by incising the cord, that otherwise would escape unrecognized.

The following comparison of the progress of the patients treated by conservative and operative methods was made. to determine what advantages operative measures offered, as shown in a small series of cases.

The comparison can be most fairly made if cases presenting evidence of injury in the same spinal segment be treated separately, and if only recently injured patients be included. The 107 patients who entered the hospital within 48 hours of the receipt of their fracture will, therefore, form the basis for comparison. These cases are distributed as follows:

		TREATED EXPECTANTLY	BY LAMINECTOMY
Cervical ...	38	27	11
Dorsal	38	17	21
Lumbar ...	22	19	3

In the cervical region, 38 cases form the basis of comparison; of these, 27 were treated expectantly and 11 by laminectomy. Two patients with fracture in the cervical spine, who were seen within forty-eight hours of the receipt of their injury, have not been included in the figures. In these two cases attempts were made to reduce the evident deformity by manipulation—a practice which is now generally considered poor.

Among the 27 patients who were treated conservatively, 6 had injuries other than fractured spine—5 with signs of complete and one of incomplete destruction of the cord—and 21 suffered fracture of the cervical spine only; 11 with signs of a complete myelitis, 6 of a partial myelitis, while 4 had no signs pointing to injury of the cord.

Five of the 6 patients with injuries in addition to the spinal fracture were either unconscious or in profound shock when first seen in the accident room, and the sixth gave a history of unconsciousness following his fall; in other words, their general condition was such as to put operation out of the question. Three of the six died within twenty-four hours, one lived two days, one lived three days, whose signs pointed to a subtotal cord destruction, and the mother of the sixth patient took her from the hospital on the nineteenth day following her injury, that she might die at home. She had been delirious the last four days of her stay in the hospital, her temperature was ranging between 99 and 106, and it was a matter of but a short time till death should relieve her suffering.

Ten of the eleven patients with signs of complete myelitis, but no other accompanying injuries, died in the hospital,—four died inside of twenty-four hours, one in 3 days, one in 5 days, one in 6 days, one at the end of a week, one after 15 days, and one after 16 days. The eleventh patient remained in the hospital 8 weeks, when he was transferred to another institution. Not one of the patients in this class showed even symptomatic improvement during their hospital stay.

But two of the 6 patients died who suffered a cervical fracture and had signs of cord injury, but not of complete severance of the cord. One died inside of 24 hours and one at the end of three weeks, though the three weeks he lived produced no improvement in his condition. The remaining 4 patients made definite improvement. They were able to use their arms and hands to some extent, though in no instance perfectly; could all walk unassisted though awkwardly, and two regained control of their sphincters. Since leaving the hospital one patient has made a complete functional recovery, and at the end of a year was working at his old position as brakeman on the railroad.

The first definite improvement in these cases, as noted in the records, began between four days and two weeks after entrance to the hospital. The hospital stay varied from three to eleven and a half weeks.

Each of the four patients who suffered fracture of the cervical vertebrae, but who presented no signs of cord injury, remained in the hospital three weeks. During this period no symptoms developed. Two of these four have been seen a year or more after their injury and are perfectly well.

Eleven patients were subjected to laminectomy, and none of them had received injuries other than fracture of the cervical spine. Nine of this number on the first examination showed signs pointing to a transverse myelitis, and two had signs of cord injury, but not of complete destruction.

Seven of the nine patients with signs of complete cord destruction were operated upon within twenty-four hours of the receipt of the injury. One patient died on the table, and one patient stopped breathing as the operation was about to begin, and artificial respiration was necessary for some time before operation could be done. Two patients died inside of twenty-four hours, two inside of forty-eight hours, and one at the end of five days, one at the end of two weeks, and one lived within a couple of weeks of a year. With the exception of the last case, which was reported by Mixter and Chase,* no patient showed improvement before death. The last-mentioned case on entrance presented all the signs of a transverse myelitis with complete motor and sensory paralysis below the fifth cervical segment, retention of urine and feces and absence of all reflexes, superficial and deep. Two days after the operation, tactile sensation had begun to return. In a week tactile sensation was present over the arms, body and legs. Within two weeks the knee jerks and plantar reflexes had returned. Within a month motion had begun to return in arms and hands and legs. After eight months he was able to move himself about in a wheel chair, had moderate control over both sphincters and had some power in the muscles of his legs. The immediate cause of his death was a calculous nephritis. A post-mortem examination was made and sections of the cord at the site of the crush proved that the cord at this level had not been entirely disintegrated. One patient submitted to laminectomy on the fourth day following his injury. On recovering from ether he had great difficulty in breathing, but this passed off in twenty-four hours. During the three weeks following his operation that he remained in the hospital, no improvement in his condition was noted, and he finally died six weeks after his accident. One patient was operated upon six days after his accident. He remained in the hospital six weeks after his operation, but during this time he did not improve.

The two patients with signs of cord injury, but not of a complete crush, had laminectomy done, one on the third and one on the fifth day, but both died on the fourth day following their operation, without any evidence of lessening of the paralysis.

Summary of fractures in the cervical region: all six patients with injuries accompanying the spinal fracture died—five inside of a week. Ten of the eleven patients with fracture of the cervical vertebrae and no accompanying injuries, whose neurological signs pointed to a complete severance of the cord, died, the majority inside of two weeks, and none improved any before death. Four of the six patients with cord lesions, not complete, improved very markedly under conservative treatment, and four, who had no neurological symptoms on entrance, developed no symptoms during their stay in the hospital.

Of nine patients with fracture of the cervical spine and signs of complete severance of the cord, subjected to laminectomy, there was one operative death. Eight died in the hospital, the majority inside of two weeks, but a much smaller majority than in the same class treated conservatively. One patient only improved following the operation, and though his improvement was very great, the autopsy findings showed that the injury to his cord was not complete, and it is questionable whether like betterment had not taken place had no operation been done. Both patients with signs of a partial myelitis, who were operated upon, died inside of two weeks and showed no betterment following the operation.

In this small series of fractures in the cervical spine with signs of cord injury, the only benefit that was derived from operation was a possible prolongation of a miserable existence in the patient with original signs of complete crush of the cord. That improvement does take place where the cord is not severed is shown by the progress of those patients treated conservatively. That laminectomy improves the chances for recovery is not shown in this small series of cases.

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* Mixter and Chase: Annals of Surgery, 1904, Vol. xxxix, p. 495.

Thirty-eight fractures of the dorsal vertebrae were first seen within forty-eight hours of the receipt of injury, of which seventeen were treated conservatively and twenty-one subjected to laminectomy.

Nine of the seventeen treated conservatively had other injuries complicating the spinal fracture. Two had signs pointing to complete destruction of the cord, and both died,—one within twenty-four hours and the other within forty-eight hours of the accident. One patient, the victim of a cave-in that crushed his chest, producing a subcutaneous emphysema, as well as fracturing his dorsal spine, presented signs of subtotal cord destruction; some sensation remained in the flaccid legs, though all reflexes and sphincteric control were lost. During the seventeen weeks he remained in the hospital he improved symptomatically in that the original hyperesthesia of the skin lessened, and he acquired the power of moving certain muscles in his legs a bit, but he failed in that time to regain control of his sphincters, and no note of the return of reflexes is made in the records. Two patients were moribund when first seen, and examination to reveal the extent of cord injury was unwarranted. Four patients had no symptoms pointing to cord injury. Three of the four died inside of forty-eight hours, and in one case the vertebral lesion was discovered at autopsy. The remaining patient stayed in the hospital three and a half weeks, during which time no signs pointing to cord injury developed. Of eight patients who suffered vertebral fracture alone, two had signs of injury to the cord, but not of complete destruction, and made complete recoveries. Loss of sphincteric control and inequality of the knee jerks, persisting for four days, were the cord signs presented by one of these patients, and the other patient had urinary retention and loss of the abdominal and patellar reflexes on one side, though no motor nor sensory paralysis was notable. In ten days the sphincteric disturbance had passed. During the month he remained in the hospital no new symptoms developed. Six patients who had no signs of cord injury were kept in the hospital under observation from one to three weeks, during which time no pressure symptoms developed.

Only four of the twenty-one patients on whom laminectomy was done had injuries other than spinal fractures, three presenting signs of complete and one of incomplete myelitis. Two of the three complete myelitis cases had suffered broken ribs, and a third a double Colles' fracture. All were operated upon within twenty-four hours of the accident. Two died, one in five and a half weeks and one in ten weeks. The third patient was alive a year after his discharge from the hospital, but he had not improved and was bedridden. The patient with a partial myelitis received fractures of both femora and fractured ribs, as well as a fracture of the spine, but on entrance no cord symptoms were noted. On the morning of the second day, in dressing his legs, it was found that sensation was absent. In the evening all power of motion had been lost. Laminectomy was done on the fourth day, and he died on the sixth, experiencing no benefit from the operation.

The remaining seventeen patients had no other injuries than the vertebral fracture. Thirteen on entrance showed signs of a complete transverse lesion of the cord, two of a partial injury to the cord, one had no medullary symptoms, and in one case the results of examination are not stated in the records. Eight patients with symptoms of complete crush of the cord and the one patient whose record is incomplete, were operated upon within twenty-four hours of the receipt of their injury. One death occurred on the operating table, one death an hour after reaching the ward, one died after seven weeks and one after four months. Four patients were unimproved on discharge from the hospital, one to four months after operation. One patient, who improved not at all during the five months succeeding his operation that he remained in the hospital, was reported to have improved symptomatically during the next six months in that "reflexes returned in both feet." In eighteen months from the date of injury he reports that he could distinguish between heat and cold in right foot and left thigh, but that he had no control over sphincters and had regained no motor power in the legs. One patient with symptoms of complete crush was operated upon forty-eight hours after his injury. Within two days motion was noted in the toes; within ten days the zone of anesthesia had fallen two inches and plantar reflexes were obtained, but there was no improvement in sphincteric control or motor power, and in the following two weeks no gain took place. He died during the ensuing year. Laminectomy was done on one patient on the fourth day, and he died four days after the operation; another patient submitted to operation on the fifth day and within two weeks of the operation his knee jerks had returned, but the following two months yielded nothing more. One patient developed delirium tremens the day after his injury, and operation was postponed for two weeks, but no improvement followed during the next two months.

Two patients were operated upon whose symptoms pointed to cord injury but not to complete crush. One patient on entrance presented a flaccid paralysis of both legs, with abolition of patellar and plantar reflexes, retention of urine and feces, but sensation in the legs was not lost, though somewhat dulled. Laminectomy was done within twenty-four hours. In three days after the operation sensation in the legs was normal; in twelve days there was a slight power of motion in the left foot; in a month he could voluntarily control the right calf muscles; in six weeks he could turn in bed without help; in two and a half months he regained control of his bladder; in six months he could stand with support, but complete control of the muscles of his lower extremities had not been acquired. The second patient on entrance had a partial motor paralysis of the right leg and a hyperesthesia of the legs, with sphincteric retention, but reflexes unaltered from the normal. Operation was postponed, on account of poor general condition, for seven days, but in the meantime he had recovered control of his sphincters, and had regained the motor power in the right leg to a large extent. Progressive betterment continued after operation. Four weeks after the operation all symptoms referable to the cord had disappeared, and in six weeks after the operation he was discharged on crutches.

The patient who had no cord symptoms was subjected to laminectomy within twenty-four hours. He remained five weeks in the hospital and developed no neurological symptoms.

Summary of fractures in the dorsal region: As in the cervical region, fracture of the dorsal spine, accompanied by other injuries, is very fatal, whether the cord be apparently totally or incompletely destroyed. Seven of nine patients thus injured died within forty-eight hours of their accident. Two patients with dorsal fracture, uncomplicated by other injuries, had medullary symptoms, though not symptoms of complete severance of the cord, and made complete recoveries. Improvement began between four and ten days after the receipt of the injury. Six patients with fractures and no signs of cord injury developed no medullary symptoms during the period of hospital observation.

Operative treatment certainly shortened the lives of two patients among the twenty-one subjected to laminectomy,—one death on the table and one an hour following operation. With one exception, the accompanying injuries of those patients operated upon who received other injuries than the vertebral fracture, were less severe than among those treated conservatively, and though three of the four died, they lived longer than those who were treated by palliative methods. The fourth patient reaped no benefit from his operation. Thirteen patients with fracture of the dorsal spine with signs of transverse myelitis but no accompanying injuries, were the subjects of laminectomy. Six died, two immediately after, three within four months, and one inside of a year. Five showed no improvement during their hospital stay. One patient who died and two patients who were discharged from the hospital showed slight symptomatic improvement after operation, but did not regain lost function. Two patients with signs of incomplete cord injury, made marked progress. One of these patients had gained considerably before operation was done; and the gain in the other case was very slow and the rôle the laminectomy played is open to question.

The results of laminectomy in fractures of the dorsal spine, as in fractures of the cervical spine are no better than the results of conservative treatment, and in this series of dorsal fractures laminectomy resulted in two deaths. Such improvement as followed operation in these cases cannot be credited to the operation, since patients who were treated conservatively made equal gain. The indication for operation on the patient who had no cord symptoms is not clear, since four patients under similar circumstances, treated conservatively, developed no cord symptoms.

With fracture of the lumbar spine, nineteen patients were treated conservatively (patients who received simple process fractures have not been included in this number) and three treated by laminectomy.

Ten of the nineteen cases treated by conservative methods sustained other injuries than the spinal fracture. Two showed signs of complete crush of the cord, and both died—one inside of twenty-four hours and the other in three weeks; two others were moribund on entrance and died within a few hours, and examination to determine the extent of the cord injury was unwarranted. In six instances the spinal injury, associated with other injuries, was accompanied by signs of cord injury, but not complete destruction. Three of these patients died within twenty-four hours. In two instances the only sign of cord injury was loss of control of the sphincters, lasting in one case four days and in the other twelve days. In the sixth patient, who had suffered compound comminuted fracture of both legs, loss of sensation in the legs was first noted while changing the dressings. It was obviously impossible at this time to test for motor paralysis. She remained in the hospital four months, during which time she regained control of her sphincters. When her plasters were removed six weeks later, tactile sensation had returned in her legs, but there was considerable loss of motor power and loss of patellar reflexes. She was, however, able to get about on crutches. In the following two years there was no further gain.

Of nine patients with fracture of the lumbar spine, unaccompanied by other injuries, one patient presented signs of a complete transverse lesion of the cord, five presented cord symptoms, but not of a complete severance, and three had no signs pointing to medullary injury. The patient with the complete transverse myelitis remained but one day in the hospital, since operation was not advised. In two patients loss of control of sphincters for two or three days was the only sign of cord involvement, and no other signs developed during the month each remained under observation in the wards. One patient on entrance had total loss of sensation below the knees on both sides, retention of urine, abolition of patellar and plantar reflexes, but retained slight motor power in both legs. In ten days sensation had returned almost completely in one leg, and the opposite foot alone was anesthetic. He was also able to flex and extend his legs, though there was no power over ankles or toes. In five and a half weeks he was able to pass his urine voluntarily, but there was no increase in muscle power. Another patient's cord symptoms consisted in numbness of the legs and unequal patellar reflexes. His bladder control was not affected. He developed delirium tremens on the second day. At the end of two weeks, when he was transferred to the psychopathic hospital, the numbness of the legs had been replaced by a hyperesthesia. No note was made on the reflexes on discharge. The last patient in this group had an anesthetic strip over the outer aspect of one leg. There was no noted paralysis and no bladder symptoms. At the end of a month he walked from the hospital, but no record is made as to the anesthetic zone at this time. Each of the three patients with lumbar fracture and no cord symptoms remained under observation for three weeks, and, since no signs referable to the cord had developed, was discharged.

Only three patients with fracture of the lumbar vertebrae were subjected to laminectomy. Each at the first examination presented a total motor and sensory paralysis below the injured cord segment, with retention of urine and feces, and loss of both superficial and deep reflexes. In two instances, operation was done within twenty-four hours. In one instance, two days after operation, there was a marked lessening of the extent of the zone of anesthesia and in three weeks slight power was present in the adductor group of muscles of one leg, but at the end of six months he had improved no more and was transferred to another institution. The other patient made no gain after operation, and died in eighteen days from a septic meningitis secondary to the operation. The third patient was operated upon four days after his injury, but in the following two months no betterment had resulted and he was transferred to another institution.

Summary of lumbar fractures: As in the two other segments of the spine, fractures in the lumbar region, accompanying other injuries, are generally fatal, and regardless of whether the cord lesion is complete or partial. Seven deaths within twenty-four hours and one death within three weeks among ten patients thus injured tells the story. Where there were no accompanying injuries the cord injuries associated with lumbar fractures are less severe than in the other two segments. Thus among nine patients treated conservatively, one case only presented signs of a complete medullary lesion, and his hospital stay was too short to permit any statement to be made concerning him. All of the five patients with incomplete lesions of the cord made marked improvement, four of the five being practically normal on discharge. Three patients had no signs of cord injury on admission, and developed no signs while in the hospital.

Of three patients subjected to laminectomy, the operation must be held responsible for one life, death being due to a postoperative septic meningitis. In one instance following operation there was symptomatic improvement, and in one instance no betterment. The number of patients in this group who submitted to laminectomy is too small to allow any conclusions to be drawn.

Taken as a whole, the results of laminectomy in this series of fractures of the spine do not justify an argument in favor of operation, but on the contrary serve as a warning against radical surgical treatment. Four deaths to which operation directly contributed in thirty-five patients operated upon, is a high mortality. But six patients among the thirty-five made any improvement following operation, and in three of these cases the improvement was symptomatic only. Among the three who made decided improvement, in one case the gain had begun before operation was done, and in the two other cases it is perfectly reasonable to suppose that like improvement would have followed had no operation been done. Certainly operation is not justified unless it offers the patient a better chance for recovery than conservative treatment.

In this series of cases, with one exception, the onset of paralysis did not succeed the injury, but was the direct accompaniment of it. The paralysis was present before the effect of hemorrhage or edema or bone pressure could work on the cord. Furthermore the anatomy of the cord and its membranes differs markedly from that of the brain in that the brain lies closely apposed to its dura, whereas the cord hangs so loosely in its dural envelope that a very considerable hemorrhage may occur within the dural sheath and no compression of the cord result, and there is ample room for any swelling of the cord from secondary edema. Bone pressure following the causative accident must be rare, judging from the present series, for bone pressure was not demonstrated at operation in any of the patients subjected to laminectomy. If permanent bone pressure be present, it results from so great a dislocation of the vertebrae that the spinal canal is narrowed to limits smaller than the diameter of the cord, and in such instances, irreparable damage has been done before operation can be accomplished, and no gain should be expected.

Furthermore, Taylor's[1] observations, that cord lesions occur at a distance from the level

[1] Taylor, F. W.: Journal Boston Society of Medical Science, 1898, Vol. iii, p. 60.

opposite the site of fracture, seems to be given no weight by those authors who are enthusiastic proponents of routine laminectomy in cases of vertebral fractures with accompanying cord symptoms. In the series of cases under discussion, autopsies were performed on nineteen cases, and in three of this number areas of softening of the cord substance are described at a distance from the site of the original injury.

One instance with fracture of the fourth dorsal showed "region of softening about one centimeter in length at level of fourth dorsal, and another, somewhat larger, at level of ninth and tenth dorsal vertebrae. Serial sections one centimeter apart, show in regions of softening loss of structural markings and softening of substance of the cord almost to diffluence, the cord at these levels being grayish white and at these points but slightly diminished in size."

In another instance in which first and second lumbar vertebrae were fractured "the pia-arachnoid in mid-dorsal region for a distance of twelve centimeters below the cervical enlargement deeply blood stained. The consistency of the upper and lower levels of the cord natural; that of the thoracic segment a little diminished."

In the third instance the fifth cervical vertebra was injured. "The lower two-thirds of the cervical enlargement somewhat flattened and soft. Reflection of the dura shows no subdural hemorrhage. Section through the cervical enlargement yields pale, gray-red, pulpy semi-diffluent material. Section through lower part of enlargement shows hemorrhage into the right ventral and left dorsal horns, with yellowish softening at centre of the areas. On cross section, dorsal segment at a point seven centimeters below the cervical enlargement is slightly softened, and on section shows a central area, grayish-red and semi-diffluent. This condition limited to a region about one and five-tenths centimeters in length. On serial section, elsewhere normal."

In this small series of cases on which necropsy was done, sixteen per cent. showed cord lesions so remote from the site of injury that an ordinary laminectomy would completely fail to reveal them.

Several patients in this series, who originally presented signs of a complete transverse crush of the cord, improved to a greater or lesser degree, thereby proving that the cord had not been destroyed, and add to the accumulating evidence that the extent of the cord damage cannot be absolutely determined on first examination.

Laminectomy cannot be considered other than a major operation which carries a definite mortal risk with it, and the desperate condition of a patient does not warrant the surgeon in adding the risk of operation unless there is more than a visionary chance of bettering a hopeless condition. A major operation is not justified on the basis that it will do no harm, and can conceivably, though improbably, do good.

From a study of the data here presented, the writer believes that laminectomy is absolutely contraindicated in patients in shock or who have received demonstrable injuries in addition to the spinal fracture and the cord injuries accompanying it; that laminectomy is contraindicated in patients with fracture of the cervical spine, whose respiration is embarrassed by paralysis of the intercostal muscles; that laminectomy is contraindicated in all patients whose paralysis accompanied the accident, and was noted immediately after accident; that laminectomy is contraindicated before the fourth day of convalescence, because where improvement takes place such improvement cannot be expected to manifest itself before the fourth day; that laminectomy is contraindicated in all patients who are improving under conservative treatment, and laminectomy cannot be expected to better conditions if improvement, once shown, comes to a standstill; laminectomy is contraindicated in patients whose vertebral fracture is unaccompanied by medullary symptoms.

Laminectomy is indicated in the rare cases of gradual onset of medullary symptoms, and in patients who, originally free from cord symptoms, begin to develop symptoms referable to the cord.

In conclusion, the study of this series of cases seems to warrant the following deductions: Fracture of vertebral bodies is generally caused by a hyperflexion of the spine first crushing the bodies; if the flexing force is continued the inelastic posterior arch gives way before the more elastic interspinous ligaments. Fracture of vertebral processes occurs in the lumbar region and results from direct trauma.

The mid-cervical and dorso-lumbar regions of the spine are most frequently injured.

Tenderness over the site of injury is the most frequent and reliable sign of vertebral fracture.

Shock is not common in vertebral fracture, regardless of the accompanying cord lesion, and the presence of shock is indicative of complicating injuries.

The presence of priapism is a bad prognostic sign.

Injury to the cord, where present, is an accompaniment of the spinal fracture in a very large majority of cases; not secondary to hemorrhage or edema or persisting bone pressure, which are of relatively rare occurrence.

Laminectomy in this series has been accompanied by a definite operative mortality, and operative treatment in the present series has not shown better results than conservative treatment. Laminectomy is contraindicated in all patients who have received injuries in addition to the spinal fracture, and in all patients with uncomplicated vertebral fracture, whose cord injury accompanied the fracture, until at least four days have passed—the minimum time for spontaneous improvement to manifest itself.

THE CLASSIFICATION OF HAY-FEVER POLLENS FROM A BIOLOGICAL STANDPOINT.

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The knowledge of the exact pollens which cause hay-fever is important from an etiological as well as from a prophylactic and therapeutic standpoint. In the prevention of hay-fever, we must know the plants which produce the noxious pollens in order to eradicate them or prevent them from reaching their pollinating stage, and, where these measures are not feasible, to have the patient avoid localities infected with these pollens. This knowledge is equally necessary from a therapeutic standpoint, as the modern treatment of hay-fever gives special prominence to methods, the correct application of which requires the knowledge of the proper hay-fever pollens.

Hay-fever pollens are not deleterious to health *per se*, as the great majority of persons (99%) are not inconvenienced by them. Those suffering from hay-fever have a special susceptibility or lower resistance which modern methods attempt to correct by immunizing the patient against these pollens.

The usual method of testing the susceptibility of the patient by applying an extract of various pollens to the conjunctival sac or scarified skin is not scientifically correct, as the question is not whether a patient reacts to various pollens, but whether he is sensitive to the pollen to which he is exposed.

We have, for instance, found many persons in the East susceptible to the pollen of the Western mugwort (Artemisia heterophylla), but the therapeutic use of this extract, in spite of the patient's reaction, would not be indicated in New York or Pennsylvania, as this weed is found in the Pacific States and not in the Eastern or Southern States. In the same manner, many patients in California react to the pollen of the common rag-weed (Ambrosia elatior), but the use of this extract would not be advisable in California as the common ragweed is not found in that State.

The correct test of the patient's susceptibility, therefore, should be directed to the pollen to which he is exposed. This may easily be determined by the atmospheric-pollen plates and the information obtained from these should form the basis of applied pollen therapy.

ATMOSPHERIC-POLLEN PLATES.

The atmospheric-pollen plates are ordinary glass slides used for the microscope, the central square inch being covered with a uniform coating of glycerin. In localities in which the humidity causes too great liquefaction of the glycerin, we use a thin coating of boiled linseed oil.

When these plates are examined, we apply an ordinary thin glass cover, and place the slide on a mechanical stage, so that the whole field may be traversed. As the glycerin leaves a surface of uneven refraction, it is necessary to inject a solution that will correct this. We use the ordinary Lugol's solution of iodine and iodide of potash, which not only corrects the refraction, but simplifies the identification of the pollens.

All the grass (gramineae) pollens, on account of the high percentage of starch, are stained blue-black (Fig. 1) which easily distinguishes them from all the other pollens. The members of the Ambrosiaceae group, including the ragweeds, marsh elders, gaernerias and cockle burs, are stained brown by the iodine, and are recognized by the spicules (Fig. 2). The amaranths (Amaranthus spinosus), chenopods (Chenopodium anthelminticum) and docks (Rumex crispus) have a medium percentage of starch, and are partly stained by the iodine. These pollens are spherical and smooth.

The wormwoods (Artemisias) are stained brown and are recognized by their three-lobed appearance when seen from the end; otherwise they appear ovoid with one of the lines of the lobes showing longitudinally (Fig. 3).

In our biological laboratory, where we have the photomicrographs of over two hundred pollens, their identification is not difficult. Ordinarily, however, the number of varieties of atmospheric-pollen appearing on the plates is not great, and it soon becomes easy to identify them.

While several varieties of pollen are usually found, the important pollen is distinguished by its great numbers (Fig. 4). The occasional appearance of a new pollen on the plates is not of any importance.

After the pollens have been identified and counted, they are estimated on the basis of the number per square centimeter for twenty-four hours. This number, which has a definite relation to the number of pollen per kiloliter of air,[1] is important in its bearing on the development of hay-fever and its severity. With most pollens, 25 per square centimeter indicates that there is sufficient pollen in the air to cause hay-fever in most subjects, and 100 that the number of pollens will cause attacks of considerable severity. In the case of the wormwoods (Artemisias) a much smaller number is sufficient to produce this effect.

The use of the atmospheric-pollen plates is as necessary in hay-fever as making a blood test in malaria. Its value was recently demonstrated in determining the cause of an outbreak of hay-fever in Austin, Texas. Our atmospheric pollen plates were exposed by Dr. S. N. Key, and sent to our biological laboratory. The examination of these (Fig. 18) showed that the air contained an average per kiloliter of 88 pollens of the mountain cedar (Sabina sabinoida), the biological test of which showed a marked hay-fever reaction. As the cedar has not, heretofore, to our knowledge, been identified with hay-fever, the importance of the atmospheric-pollen plates in such cases was clearly demonstrated.

WIND-POLLINATED PLANTS.

The etiology of hay-fever has been greatly simplified by the knowledge that only atmospheric-pollens are responsible for hay-fever, and that these are generated only by wind-pollinated plants.[2] This fact, which we have advocated for some years, has been confirmed during the past year by the records of our atmospheric-pollen plates, and by the results of our microscopic examinations of hay-fever secretions.

As bright colors and odors in flowers are intended to attract insects, these are never responsible for true hay-fever. Some of these, such as the goldenrod, sunflower, sneezeweed, etc., have toxic[*] pollens, but as these are not atmospheric they do not cause hay-fever except on direct inhalation. The wind-pollinated plants are devoid of all attractive colors or scent, and the "flowers" or florescence are often overlooked as such, as is the case of the rag-weeds, cockle burs, amaranths, wormwoods and grasses.

All pollens from anemophilous (wind-pollinated) plants are not responsible for hay-fever, as, for instance, the sedges, rushes, pines, and many other trees. All persons susceptible to hay-fever are not susceptible to the same pollens. Many persons, for instance, suffer during the spring from the grass pollens, and recover when the atmospheric-pollen plates show that these have disappeared. Shortly afterwards, when the rag-weed pollens appear in the air, the majority of these are free of hay-fever, in spite of the fact that the rag-weed pollens usually produce a more severe reaction.

On the other hand, persons susceptible to the rag-weed pollens usually appear to be without discomfort during the spring in spite of large numbers of grass pollens in the air, but quickly develop hay-fever when the rag-weed pollens appear.

In addition to these two forms of hay-fever, we have patients who are susceptible to both grass and rag-weed pollens, and these are the unfortunates who suffer during both periods of hay-fever.

There are also various degrees of reaction among the hay-fever pollens. The most active pollens that we have tested are the wormwoods (Artemisias) of the Pacific and Rocky Mountain States. The pollen of the California mugwort (Artemisia heterophylla), for instance, will cause a reaction ten times more severe than the common rag-weed. Next to the Artemisias, we have found the rag-weeds (Ambrosias) most active, the pollen of the grasses (Gramineae) being less active than the rag-weeds.

There are also many pollens which will produce a hay-fever reaction in susceptible persons only when inhaled in very large numbers or, in lesser numbers, when inhaled by patients already suffering from hay-fever. Among these plants are the chenopods or goose-foot (Chenopodium anthelminticum, Fig. 5, album, etc.), careless weeds (Amaranthus spinosus, Fig. 6), docks (Rumex crispus, Fig. 7, obtusifolius), Western water hemp (Acnida tamarascina, Fig. 8), etc.

These plants cause hay-fever only when growing in sufficient numbers near the patient. If his residence is surrounded by such plants so as to cause a concentration of atmospheric-pollen, he may suffer considerably, but this is not the case when these weeds are at a distance of four or five city blocks. In the case of active pollens, such as the rag-weeds, this distance is not sufficient to protect the patient from their effect.

CLASSIFICATION OF HAY-FEVER PLANTS.

While the prevention of hay-fever by the eradication of the hay-fever weeds is of the highest importance, it will evidently be some time before this becomes sufficiently general to eliminate the question of treatment. While most cases of hay-fever are due to the pollen of noxious weeds, there is also a certain number of cases which are due to plants of practical use, as, for instance, rye and other grains, mountain cedar, etc. In view of this, treatment will probably continue to be an important consideration in hay-fever.

Among the various treatments which have been tried, pollen therapy has, thus far, given the most encouraging results. The number of plants, however, which may cause hay-fever is exceedingly large. Of the Artemisias, the most important hay-fever plant of the Pacific and Rocky Mountain States, there are about two hundred varieties. There are about fifteen varieties of rag-weed (Ambrosias), and as many of the marsh elders (Ivas) and cockle burs (Xanthiums), while of the grasses (Gramineae), there are several thousand varieties.

If the application of pollen therapy required the use of the extract of the same pollen to which the patient is sensitive, it would make this method clearly impracticable, especially as most patients respond to many different pollens.

We have conducted a careful series of investigations with a view of dividing all the most common hay-fever pollens into groups which should be morphologically alike, and the number of which should be as few as possible, in order to simplify the question of pollen therapy. Thus far, we have succeeded in reducing the number to four groups. Should we succeed in finding a pollen which would morphologically

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[*] "Toxic in this connection refers to the positive reaction in hay fever subjects. The existence of true toxins in these pollens is still being investigated.

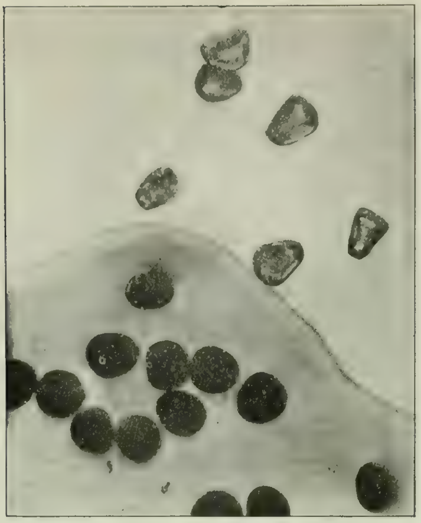

Fig. 1.—Grass pollen, showing effects of iodine solution (June grass, Poa annua). Magnified 350 diameters.

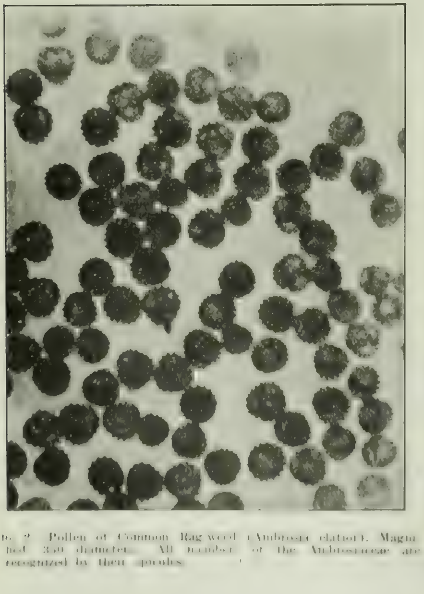

Fig. 2. Pollen of Common Rag weed (Ambrosia elatior). Magnified 350 diameters. All members of the Ambrosiaceae are recognized by their spicules.

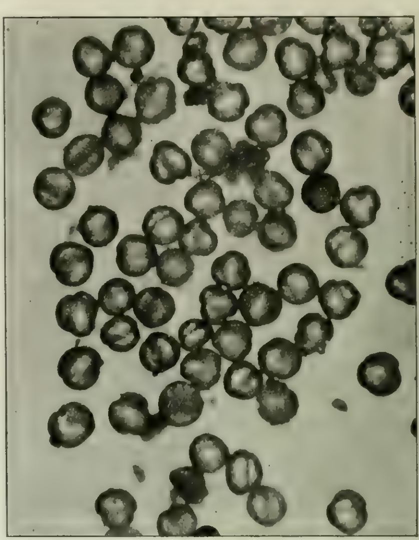

Fig. 3. Pollen of Wormwood (Artemisia heterophylla). Magnified 350 diameters. The three-lobed pollen is characteristic of all the Artemisias.

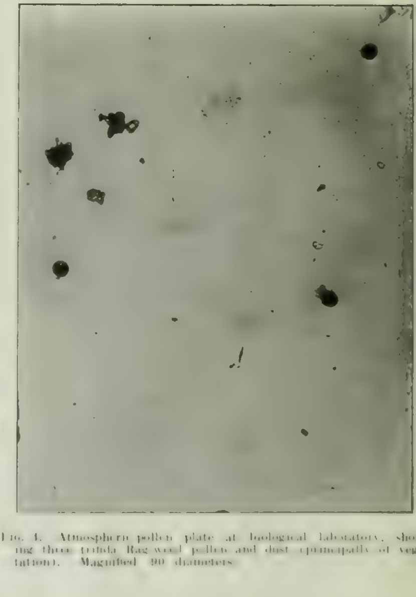

Fig. 4. Atmospheric pollen plate at biological laboratory, showing three trifida Rag weed pollen and dust (principally of vegetation). Magnified 90 diameters.

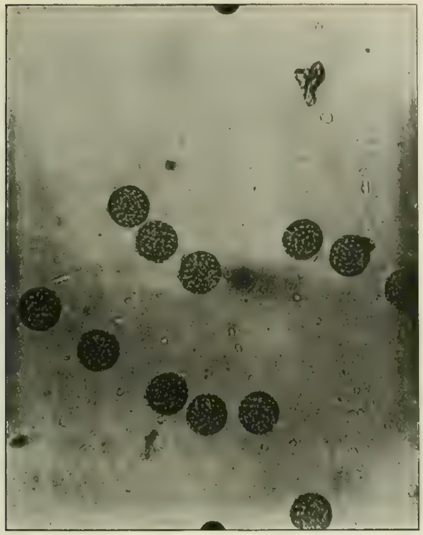

Fig. 5.—Pollen of Goose-foot (chenopodium anthemintieum). Magnified 350 diameters.

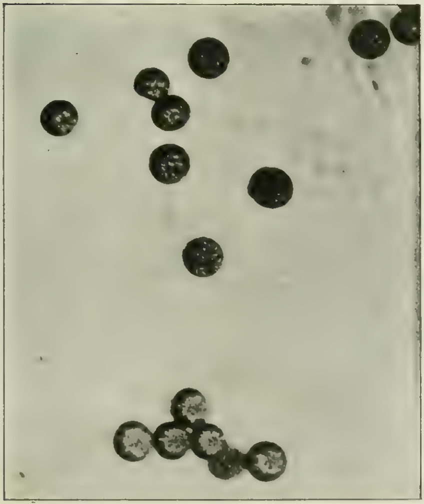

Fig. 6.—Pollen of Careless Weed (Amaranthus spinosus). Magnified 350 diameters.

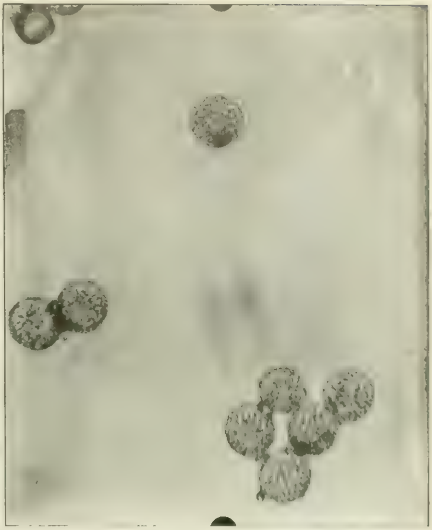

Fig. 7. Pollen of Curly Dock (Rumex crispus). Magnified 350 diameters.

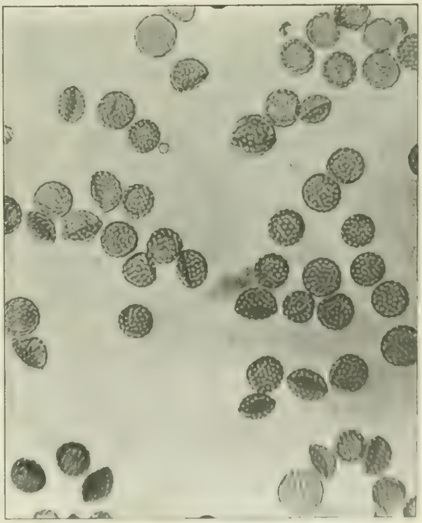

Fig. 8. Pollen of Water Hemp (Acnida [illegible]). Magnified 350 diameters.

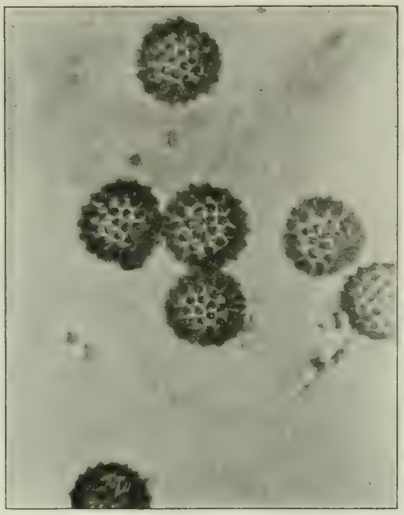

FIG. 9.—Pollen of Giant Ragweed (Ambrosia trifida). Magnified 700 diameters.

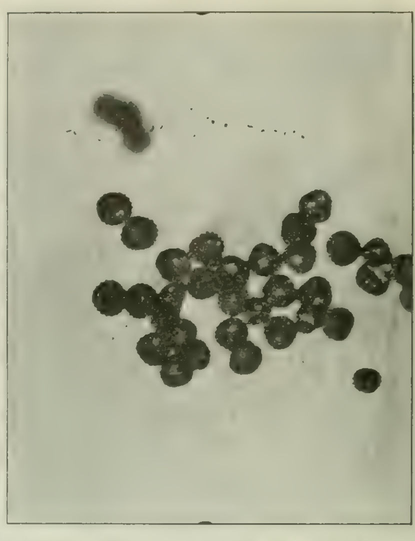

FIG. 11. Pollen of Gaertneria tenuifolia. Magnified 350 diameters.

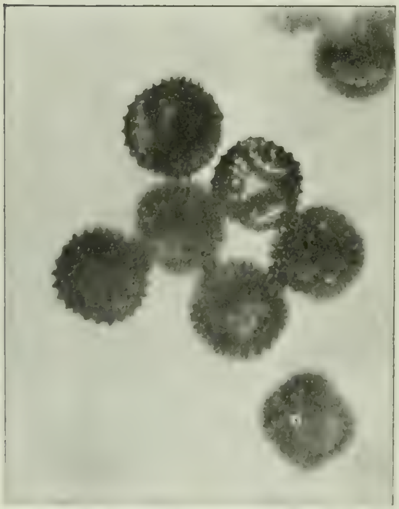

FIG. 10.—Pollen of Western Ragweed (Ambrosia psilostachya). Magnified 700 diameters.

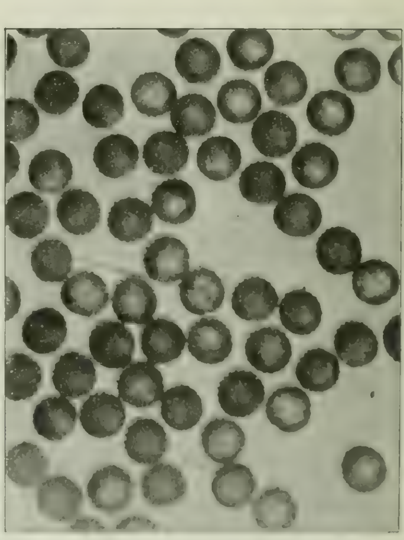

FIG. 12.—Pollen of Marsh Elder (Iva ciliata). Magnified 350 diameters.

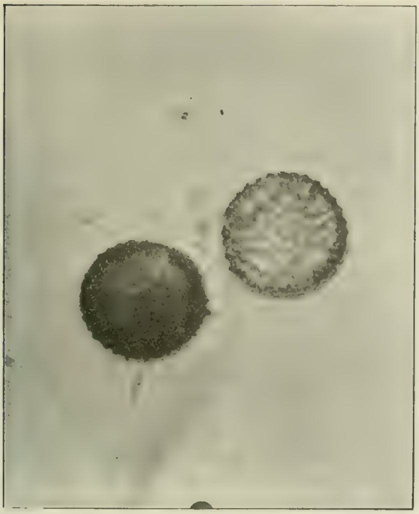

Fig. 13. Pollen of Cockle Bur (Xanthium canadensis). Magnified 700 diameters.

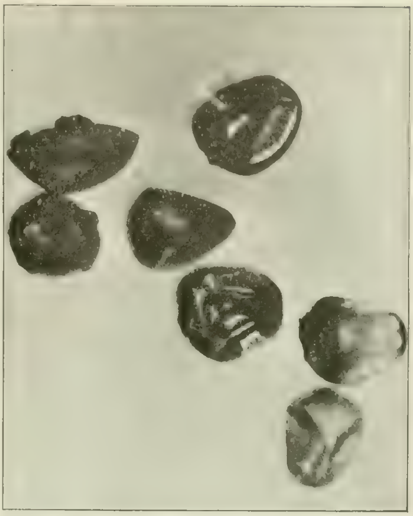

Fig. 15. Pollen of Wheat. Magnified 350 diameters.

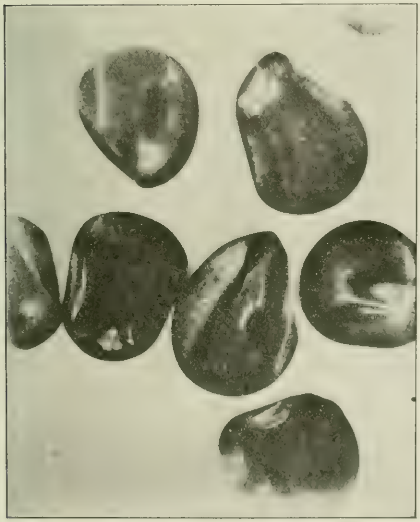

Fig. 14. Pollen of Corn. Magnified 350 diameters.

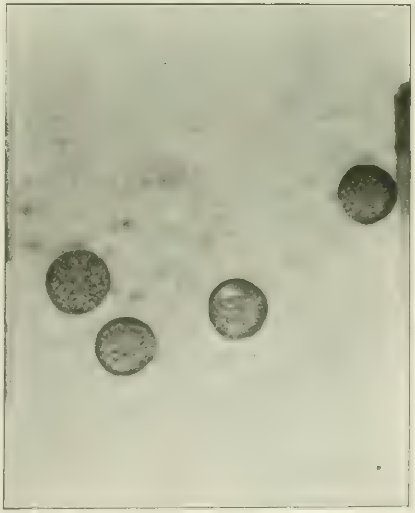

Fig. 16.—Pollen of Cockspur Grass (Panicum crus-galli). Magnified 350 diameters.

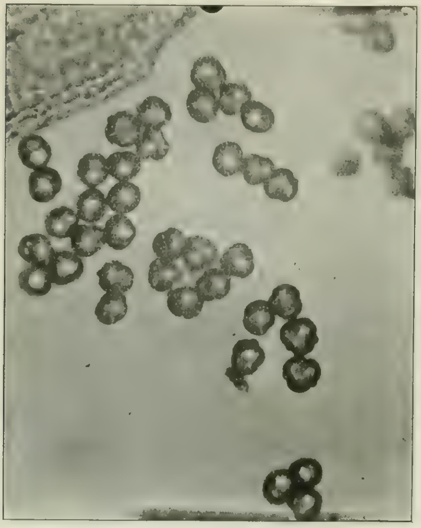

Fig. 17.—Pollen of Sagebrush (Artemisia tridentata). Magnified 350 diameters.

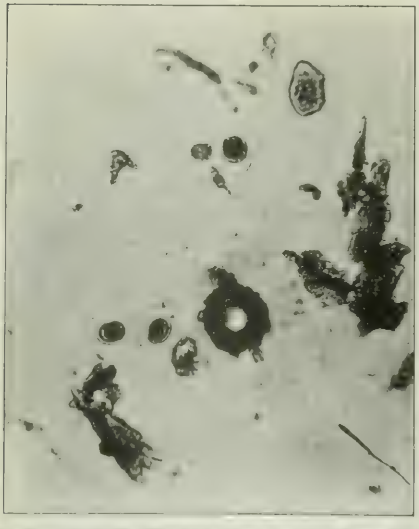

Fig. 18.—Atmospheric pollen plate exposed at Austin, Texas, showing pollen of Mountain Cedar (Sabina sabinoides). Magnified [illegible] diameters.

Note.—As the photomicrographs have different magnification, the effect is lost [illegible] the size of pollens. They have been corrected to accord with the remarks in the text.

represent these four groups, it would still further simplify the application of pollen therapy.

The four groups into which we have divided the hay-fever pollens are the following: Ambrosiaceae, Gramineae, Artemisiae and Chenopodiaceae.

THE AMBROSIACEAE (RAG-WEED) GROUP.

An extended series of tests at our biological laboratory has shown that all the pollens of the Ambrosiaceae family have a marked resemblance both microscopically and in their hay-fever reactions. They vary only in size and they present the same reaction to the Lugol solution. While their hay-fever reaction vary somewhat in the different genera, their similarity in this is quite sufficient to enable us to classify them in a single group.

Principal among the Ambrosiaceae is the common rag-weed (Ambrosia elatior, Fig. 2) which is responsible for 85% of fall hay-fever in the Eastern and Southern States. It is spiculated and measures 15 microns in diameter. The giant rag-weed (Ambrosia trifida, Fig. 9), which replaces the common rag-weed in moist sections, and which, in the general appearance of the plant has not the slightest resemblance to the common rag-weed, has a pollen with the same hay-fever reaction and microscopically differing only in size (20 microns.) The Western rag-weed (Ambrosia psilostachya, Fig. 10) also has the same hay-fever reaction, and the pollen is similar except in its size (25 microns).

The Gaertneria, sometimes called "false rag-weed," also belongs to the Ambrosiaceae family. The pollen gives a hay-fever reaction similar to the common rag-weed, and the pollen resembles them so much (Fig. 11) that they are difficult to distinguish microscopically.

The marsh elder (Ivas) is also a genus of the Ambrosiaceae family, and gives a reaction similar to the rag-weeds, but less marked. The extract requires 20% more strength to produce a hay-fever reaction similar to that of the rag-weeds. The spicules also are less prominent but more numerous (Fig. 12). They equal the Ambrosias in the amount of pollen generated. The principal varieties in the Eastern and Southern States is the rough marsh elder (Iva ciliata), but this is not sufficiently common to be of great importance, except in certain moist localities. In the Pacific and Rocky Mountain States, however, we have found the small-flowered marsh elder (Iva ciliata) and burweed marsh elder (Iva xanthiifolia) important factors in hay-fever.

The cockle bur (Xanthium) also belongs to this family and resembles the other species in the microscopic appearance and biological reaction. The spicules, however, are even less prominent than in the Ivas and more numerous (Fig. 13). The reaction is also less marked, being about 70% of the strength of the rag-weed reactions.

This resemblance in the Ambrosiaceae family in their biological reaction is very important from a therapeutic standpoint. Our tests have shown that the large majority of persons susceptible to one member of the group is susceptible also to the other members, so that all of the Ambrosiaceae family can morphologically be classified into a single group. As these form the principal cause of fall hay-fever in the Eastern and Southern States, the practical application of this greatly simplifies the subject of pollen-therapy.

THE GRAMINEAE (GRASS) GROUP.

In the gramineae (grass) family we have also a similarity of reaction. As there are altogether nearly 5000 species of grasses, this is fortunate from the standpoint of pollen-therapy. In practically all the cases which we have tested, subjects sensitive to grass pollens are also sensitive to other members of the group. The pollens of all the grasses are relatively large (30 to 80 microns), spherical and are stained blue-black by Lugol solution on account of their high proportion of starch.

The varieties of grasses vary greatly in different localities, but their reaction varies only in degree. This includes also the cereals, such as corn, rye, wheat and oats. The pollens of these, however, are relatively large (corn, 80 microns, Fig. 14; wheat, Fig. 15, and rye, 40 microns) so that they are not responsible for hay-fever except within limited areas. The grasses with small pollen, such as Bermuda grass (Capriola dactylon), June grass (Poa annua, Fig. 1) are responsible for more cases than the grass with large pollen, such as foxtail grass (Chaetochloa glauca), bull grass (Paspalum dilatum), cockspur grass (Panicum crus galli, Fig. 16), etc., on account of their greater buoyancy, which enables them to traverse a large territory.

THE ARTEMISIA GROUP.

The wormwoods (Artemisiae) also bear a marked resemblance to one another in their microscopic appearance* and chemical and biological reactions. The three-lobed form is characteristic of all the Artemisiae which we have examined, viz.: mugwort (Artemisia heterophylla, Fig. 3), wormwood sage (Artemisia frigida), sagebrush (Artemisia tridentata, Fig. 17), absinth wormwood (Artemisia absinthium), dark-leaved mugwort (Artemisia ludoviciana), biennial wormwood (Artemisia biennis), California old man (Artemisia californica), Indian hair tonic (Artemisia dracunculoides), and bud-brush (Artemisia spinescens). The wormwoods (Artemisiae) are the most important hay-fever plants of the Pacific and Rocky Mountain States, and the hay-fever reaction of all the varieties which we have examined is marked, being ten times more active than that of the rag-weeds (Ambrosiae).

THE CHENOPODIACEAE GROUP.

Among the plants which rank next to the Ambrosiaceae, Artemisiae and Gramineae are the members of the amaranthaceae, chenopodiaceae and Rumex families, which are both numerous in their varieties and general in their geographical distribution, over 50 of each having been described, most of them being typical hay-fever weeds and wind-pollinated.

The members of the amaranthaceae, chenopodiaceae and rumex generate pollens which are smooth and spherical, and having a general resemblance to one another. They also have a similar reaction to the Lugol solution, indicating a low percentage of starch. All the varieties tested give a mild hay-fever reaction and, with few exceptions, persons susceptible to one species react also to other members of the group.

The chenopodiaceae are a large family which includes, in addition to the true chenopods, several other varieties, such as the orache (Atriplex), the grease-weeds (Sarcobatus) and saltwort (Salsola). They all give a similar mild hay-fever reaction.

The branch of the Amaranthaceae family which has several members of interest in hay-fever is the *Acnida* or water-hemp. Some of these, as the Western water-hemp (Acnida tamarascina), generate a large amount of pollen. Most of these are limited to swamps and moist land. The reaction is similar to that of the Amaranthus, Rumex and Chenopodium, which they also resemble in the general appearance of the pollen.

While the members of this group give a mild hay-fever reaction, they are sometimes of importance by causing hay-fever at seasons when the grasses (Gramineae), rag-weeds (Ambrosiae) and wormwoods (Artemisiae) are not pollinating.

The similarity of the Amaranths, Chenopodia, water-hemp and docks, both as regards the character of the hay-fever reaction and the individual susceptibility to these pollens, demonstrates a similarity in their toxic principle. The indications are, therefore, that a pollen extract of any of these pollens will be applicable to all the members of this group.

In addition to the members of these groups, there are local and special cases of hay-fever due to the pollen of plants not included in these. This is the case with the Western cottonwood (Populus sargentii), to which a number of persons are susceptible. Another is the pollen of the mountain cedar (Sabina sabinoida) found in certain parts of Texas. These pollens, for instance, bear no resemblance in their appearance, chemical or biologic reaction, or individual susceptibility. Such cases of hay-fever must, for the present, be given individual consideration.

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* The only exception is the *Artemisia biennis* which has spiculated pollens but otherwise is similar in appearance and reaction.

The four groups which we have described, however, include most of the pollens that are responsible for hay-fever. As this investigation has been carefully conducted, we believe that it will not only simplify the subject of pollen-therapy, but also place it on a more scientific basis.

SUMMARY.

(1) The efficacy of pollen-therapy requires accuracy as regards the pollen to which the patient is sensitive.

(2) The test of a hay-fever subject should be directed to the pollens to which he is exposed.

(3) The atmospheric-pollen plates give definite information regarding atmospheric pollen in any locality, and should be used before testing the hay-fever reaction or applying pollen-therapy.

(4) While there are hundreds of varieties of hay-fever plants, carefully conducted tests have shown that the majority of these may morphologically be divided into four groups, the members of which are sufficiently alike in their chemical and biological reaction to warrant the same pollen-therapy.

REFERENCES.

[1] Scheppegrell, William: "Hay-fever and Hay-fever Pollens." Arch. Int. Med., 1917.

[2] Scheppegrell, William: "Hay-fever and Its Prevention." United States Public Health Reports, July, 1916.

SOME NOTES ON ARTIFICIAL PNEUMOTHORAX.*

BY PAUL H. RINGER, A.B., M.D., ASHEVILLE, N.C.

IN the course of this brief paper it is my purpose to avoid the stereotyped questions of indications for the induction of artificial pneumothorax and details of technic in its administration, and to devote my attention to stressing a few points that have impressed me in the course of four and a half years of constant use of the procedure.

Quantity of Gas to be Injected.

In the early days of my use of this method the temptation was almost irresistible, both at the first and at subsequent injections, to allow as much gas to flow in as the patient could tolerate; depending, as an indication for stopping the flow, upon marked positive manometric readings and upon the patient's statements of feeling "full" and dyspnoeic. Experience has shown the fallacy of this procedure. Now, more than 300 cc. are never injected at the first sitting (save when the gas is administered for stopping hemorrhage), no matter what the manometric readings may be, and at subsequent injections the gas is cut off when the water manometer shows a mean reading of zero, or, at most, plus 1 or 2 cm. This conservatism necessitates a few more injections per patient, but the displacement of the thoracic contents comes about far more gradually, and subjective and objective signs of discomfort and oppression are far less marked. Subcutaneous emphysema is also less frequent, and quiescent processes in the uncollapsed side are less apt to be awakened into renewed activity, as the strain is thrown more gradually upon the sound lung. Thus, from the standpoint of the patient's comfort, as well as from that of his welfare, I am convinced that conservatism with regard to the amount injected is most important.

These considerations must be disregarded when the gas is injected to compress the lung for the checking of profuse hemorrhage. Here an emergency is present and chances must be taken. I have injected as much as 1000 cc. at once to control bleeding. The brilliant results that I have obtained in bleeding cases have imbued me with great confidence in artificial pneumothorax as a hemostatic. The sudden strain thrown upon the opposite side is not necessarily damaging, for compression is to be maintained only for a length of time sufficient to permit of the formation of a firm clot at the site of bleeding—prompt and firm compression for from seven to fifteen days is necessary. Then no more gas is given and the compressed lung soon re-expands, for at that time absorption of gas is relatively rapid and pulmonary elasticity as yet unimpaired.

Pleural Effusions.

The question of the occurrence and management of pleural effusions on the compressed side is one that is the subject of much controversy. In my experience fluid has appeared in about 50% of the cases where collapse has been obtained. In some of these cases but an ounce or two of the fluid has been visible in the costophrenic sinus by means of the fluoroscope; in some the effusion has reached to the clavicle. At first sight it would seem that the appearance of fluid should be of benefit. The fluid does quite as well as the gas in holding the lung collapsed, its presence lessens the frequency of gas injections, and if there be enough, does away with them entirely. But the other side of the question must be considered. First, as regards the patient's comfort: many are greatly annoyed by the sloshing about of a quart or more of free fluid in the pleural cavity, the noise and mobilization of weight being noticed at every shifting of position. Some find the fluid very heavy, and so it often is—(in one case I removed six and one-half pounds of fluid from the right chest)—in left sided cases the weight of the fluid pressing upon the subjacent stomach causes distressing and intractable digestive disturbances. Second, as regards the patient's welfare: Were we sure that the fluid present would always remain wholly liquid and therefore be under control (*i. e.,* capable of removal at any time), the discomforts of the patient, if not too great, might be disregarded because of the obvious aid on the part of the fluid in maintaining a collapse. Unfortunately, the fluid remaining in the pleural cavity for many months not infrequently undergoes a change in consistency. It becomes thick and finally gelatinous. As soon as it has lost its limpidity we are, of course, powerless to remove it. Hence, the collapsed lung is beyond control. The gelatinous mass that sometimes results may, in time, become reabsorbed, but a great mass of thick, inelastic tissue between lung and parietal pleura remains, inhibiting the collapsed lung from any marked degree of expansion. Quite apart from the eventual desirability of allowing the collapsed lung to re-expand, it may at any moment become imperative to remove the compressing force because of renewed activity on the opposite side, and this necessity may arise even after the collapse has been maintained for over a year. In the presence of thick fluid or a gelatinous deposit, evacuation is impossible. Hence, I have made it a practice to remove promptly any considerable accumulation of fluid (by that I mean any amount reaching the 4th rib) and substituting gas for it either at the time the fluid is withdrawn or shortly afterwards. The fluid may re-collect in the pleural space. If this occurs, paracentesis is again performed. It may be necessary to tap even a third time. If after this, the fluid still re-collects, I keep the patient under weekly fluoroscopic examinations in order to demonstrate the limpidity of the fluid or to discover any signs of its becoming thickened, and tap from time to time, usually when the fluid reaches or over-tops the fourth rib.

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* Read before the Buncombe County Medical Society at Asheville, N. C., 1916.

Air Embolism.

The great danger at the initial injection of gas is that of air embolism. This occurrence is rare, but its great fatality makes it ever dreaded. In initial injections performed by myself in some fifty-five cases and witnessed in more than one hundred additional cases, I have not yet seen this phenomenon; despite this, I never approach a new case without the thought and dread of this occurrence. Air embolism may be brought about without any gas having been injected. When the needle is inserted, it may be pushed too far in and puncture the lung, tearing one of the vessels in the walls of the air alveoli, or going through the wall of a known or unsuspected cavity. Under such conditions, the laceration may be so situated that with each inspiration air from the lung is aspirated into the pulmonary vessels, air embolism resulting. This is by no means a fanciful theory, as deaths have been reported from air embolism and this mechanism of its causation demonstrated at necropsy. Avoidance, or at any rate lessening, of this danger can be brought about, first, by having the field of operation the highest point of the chest; thus, if the mid-axillary region be chosen, a pillow or sand bag placed beneath the patient in such a manner as to make the field of operation convex, will serve the purpose; second, by inserting the needle very slowly and steadily through the chest wall until it is thought that the pleura is reached, and by not inserting the needle at a greater depth than 3 or 4 cm., though in patients with very thick chest walls this latter rule must be disregarded. Saugmann, of Denmark, is very insistent upon not inserting the needle too deeply, and uses a needle with an adjustable washer, or shoulder, which he fixes at 3 cm. from the point, so convinced is he that the distance from skin to pleura is never more. I have not used this type of needle.

Gas Pockets.

It is often possible to obtain only small pockets of gas varying in size from 50 cc. to 200 cc. each.. All authorities advise continuing injections in these cases in the hope that the limiting adhesions will give way, the pockets coalesce and a collapse be obtained. In accordance with these precepts I have kept patiently at work, but my results have been disappointing, and I feel very dubious about ever getting a really satisfactory collapse unless from the start gas flows in with comparative ease. Not infrequently, fine, fresh, exquisitely painful adhesions are encountered that yield easily. In such cases success may come. But in those cases where typical pockets form, failure has been my lot.

Partial Collapse.

A word must be said relative to partial collapse. While, of course, brilliant results are to be obtained only from total collapse, yet partial collapse must not be looked at askance, as it is often the means of prolonging life, relieving symptoms and rendering the patient infinitely more comfortable. In cases where partial collapse, alone, is obtainable, it usually happens that the walls of cavities are not closely coapted, and consequently secretion from these walls continues. Hence, symptoms of cough and expectoration will not wholly subside, a certain amount of absorption of toxic material will always take place, and gas injections in such cases must be indefinitely continued.

Duration of Collapse.

Duration of collapse in cases where a complete result has been obtained should be from eighteen to thirty-six months, preferably the latter. I am a great advocate of "let well enough alone," and when a case is wholly collapsed, the sound side standing the added strain well, no fluid present, and the patient practically free from symptoms, I am loath to advocate re-expansion under three years or more. We may *think* healing has taken place: we do not *know*.

Moreover, in the majority of cases when the pleural layers are again allowed to coapt, they adhere once and for all, the gas having acted in the nature of an irritant to the membrane, and further injections of gas are out of the question. This is not invariably the case, for Dr. James A. Miller, of New York, told me of two cases of his that had been allowed wholly to re-expand and with whom he had subsequently been able to resume gas. Such patients are, however, the exception.

A word or two as to the personal opinion of the writer on the question of artificial pneumothorax. I think I may characterize myself as a conservative enthusiast with regard to artificial pneumothorax, save in those cases where gas is administered for the control of hemorrhage, when I become an unreserved enthusiast. I know of no result in tuberculo-therapy more brilliant than the change wrought by the successful induction of pneumothorax. The return to health and the subsidence of symptoms are sometimes so rapid as to be almost uncanny. But again there is the other side of the picture. We see few bluer and more despondent patients than those upon whom pneumothorax has been tried without success. They feel that the last straw has snapped, and alas! in the vast majority of cases they are right. The method is usually tried on advanced cases or in those in whom there is going on a rapid dissemination from a relatively small primary focus. If collapse fails, we are left face to face with prolonged bed-rest, etc., all of which has probably already been resorted to before pneumothorax was attempted. Again, there are no sadder pictures than are presented by those unfortunates in whom pneumothorax has worked wonders and in whom those wonders fade away before our eyes with the awakening to activity of a previously quiescent focus in the good side. We take out the gas—the focus may quiet down—but the last condition is never as good as the first, and more often the patient goes steadily down hill. Judgment and more judgment is needed in the selection of cases. But few there are that will be wholly unilateral. Then the question presents itself, will the relatively sound lung hold? Some we know will not—that settles it—but the borderline case is hard indeed to decide. Experience, small injections and frequent and repeated stethoscopic examinations of the sound side are necessary to reach a satisfactory conclusion.

While the preceding paragraphs may sound skeptical and possibly pessimistic, it is not the intention of the writer to convey that impression, but merely to stress the point that, despite the wonders wrought in certain cases by the use of this method, the way is fraught with danger and many and many a time failure will be our lot. I do feel, however, that the induction of artificial pneumothorax in the treatment of pulmonary tuberculosis is a procedure that should be at the command of every man dealing largely in pulmonary affections. In an analysis of thirty cases of my own recently reported before the North Carolina Medical Society I was able to report success in 23 per cent. and adding thereto three successful injections for hemorrhage, a total of 33 per cent. was attained. Surely this is enough, and far less than this should be enough, to warrant the use of the method which is, as far as I know, the only procedure at our command by which we can offer, to a certain number of advanced cases, a one-in-three chance of a return to health and working efficiency.

In conclusion, I would express my thanks to my friend and colleague, Dr. Charles L. Minor, of Asheville, for his great kindness and courtesy in allowing me the free and constant use of his excellent fluoroscopic apparatus, enabling me thus to keep my patients under far better observation than I should otherwise have been able to do.

Clinical Department.

A CASE OF PERNICIOUS ANEMIA IN A SYPHILITIC TREATED WITH SALVARSAN.*

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Pernicious anemia as a cause of mental disturbance is uncommon, at least in this hospital, forming only a small fraction of a per cent. of the admissions. The psychosis is usually in the form of a depression.

This case is, therefore, unusual in the form of the psychosis. In addition, there was an interesting diagnostic problem, and finally, the man had been treated with salvarsan within a few months prior to the development of the anemia.

It is not my intention to present a study of the cerebral pathology as such; that is reserved for use in another connection.

Male, age 37, admitted to Danvers October 27, 1914. Born in Germany, 1877. Family history not remarkable. "Spinal trouble" as a baby. Operated for inguinal hernia, 1896. Otherwise well. Meagre education. Has worked as cooper, tinsmith and baker, which occupation he has pursued for some years. In his youth well liked, jovial, easy going. Intoxicated three or four times a year for many years, increasing of late.

At 20 a chancre, with treatment "for some time." For five years past treated for chronic nephritis. In July, 1913, went to the Massachusetts General Hospital complaining of feeling weak, headaches and abdominal distress. Wassermann reaction blood serum strongly positive. X-ray of abdomen gave a picture diagnosed as adhesions in right upper quadrant, involving stomach and hepatic flexure. In August and September he was given four doses of .3 gm. salvarsan. In October, condition good. In November, complained of cough. X-ray diagnosis, phthisis with calcification. Physical; lungs negative. In June, 1914, Wassermann reaction blood serum positive. June and July, 2 doses salvarsan.

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* A contribution to the William Leonard Worcester Series of Danvers State Hospital Papers, presented November 19, 1915.

For ten years migraine attacks, increased in severity and frequency of late. Married in 1906. No children. No miscarriages. For about four years very nervous, aggressive, irritable, violent temper. For three years unable to work steadily, and for 17 months, no work. Wife twice left him in this period because of his attitude toward her. For the past year practically always in a fighting mood. Twice arrested for fighting and drunkenness. Two weeks before commitment, secreted a knife under his bed clothing. About this time delusions became prominent. Thought he was dying. Wanted to become a Catholic so could claim his wife in the next world. Prayed much. One night said to his wife, who was lying quietly in bed, "Why are you dancing, and why is the house shaking?" Complained of white pigeons hanging over him.

The next night he became violent, leaped through the glass in a door and ran amuck on the streets in his night clothes, with a milk bottle as a weapon. Taken by the police to a general hospital, he was committed here three days later.

Here he was constantly restless, talkative and noisy; disoriented in all spheres; hallucinated and deluded. He had visual and auditory hallucinations. Thought he had been murdered, his body sawed in two in the median line. Then thought he was a Jewish rabbi in a Jewish church. Thought they were making a rocking-chair out of his body. Much of his conversation was incoherent. Afraid of being poisoned. Thought his eyes had come out of his body. Marked impairment of memory. Sense of choking.

Physical examination:—An emaciated man with yellow skin (not jaundice). Heart enlarged; all sounds feeble. A presystolic murmur at the apex transmitted upward. Liver dulness extended three fingers below costal border. Liver not felt. Spleen not enlarged. Penile scar. Pupils equal, react sluggishly to light and accommodation. Slight edema of feet. Knee jerks increased. Shuffling gait. Positive Romberg. Suggestion of Babinski. Stereognostic sense unimpaired. Tactile appreciation normal.

Wassermann on blood serum negative; spinal fluid negative; albumen normal; globulin negative; cells 3; gold 00000 00000. Blood examination; hemoglobin 40%; red cells 680,000; white cells 7600. Eosinophiles 0.6%; polynuclear 66.6%; mononuclear 32.6%. Normoblasts and macrocytes were observed. There was poikilocytosis and polychromatophilia. Hemoglobin 35%; red cells 500,000; white cells 6500.

As he failed he became quieter. Diagnosis. November 12, 1914: At first thought to be paresis, and some thought so even with the normal fluid. Others, psychosis associated with pernicious anemia.

Autopsy No. 1773—Two hours post-mortem. Summary of the autopsy findings: skin yellow; inguinal adenitis; pupils equal, dilated; fat, deep yellow; adhesive pleuritis, right and left; blood fluid, very light red color; hypertrophy and dilatation of heart; mitral stenosis; aortic valve fibrosis; "tiger lily" heart; active and healed (calcified) tuberculosis, both lungs; fatty kidneys, fibrosis; fatty liver.

Head:—Scalp not remarkable. Calvarium thickened in occipital region. Wide line of diploe. Dura thickened, silvery white, not adherent. The pia is very slightly thickened. Basal vessels not sclerotic. Brain wt. 1275 g. Pons and cerebellum, 160 g. Cerebellum firm. Floor of 4th ventricle smooth. Brain somewhat soft with "sticky" feel. Frontal atrophy. Brain very pale. Pia adherent.

With the exception of the slight changes in the pia, there is nothing in the gross brain findings to indicate paresis. Microscopic examination. Heart, kidneys, liver and adrenals show very marked fatty changes. There is a sub-acute tubular nephritis. The lungs show active and healed tuberculosis. A peribronchial lymph node also shows a cellular tubercle. Hypophysis, slight connective tissue increase in anterior lobe.

Nervous system: Ten areas of cortex, 2 of the cerebellum, 1 of the medulla and 3 of the cord show none of the classical findings of paresis. There is slight fibrous thickening of the leptomeninges. At one point between the cerebellar folia is a single small collection of round cells. Judging by the appearances in surrounding areas, these cells are migrated glia cells.

There are no degenerations by the Marchi and Weigert methods.

The most important diagnostic question involved here was whether or not the man was a paretic. Obviously, from the description, he was not.

However, there are other important points. Salvarsan has been used in the treatment of anemia, apparently without untoward effects. In this case pernicious anemia developed some time after treatment with salvarsan. Whether this relation is purely incidental is uncertain, although it probably is, in view of the large number of persons who have been treated with salvarsan.

Book Review.

Diseases of Children. A Manual for Students and Practitioners. By George M. Tuttle, M.D., Clinical Professor of Pediatrics, Washington University Medical School, and Phelps G. Hurford, M.D., Pediatrician, St. Louis Lutheran Hospital. Third edition, thoroughly revised and enlarged. Illustrated with 47 engravings and 3 plates. Philadelphia and New York: Lea and Febiger. 1917.

This book, now in its third edition, is midway in size between the quizz compend and the ordinary text-book. It is necessarily superficial, but on the whole little objection can be taken to the contents. It is hard to see, however, why anyone should care to use this book when there are so many fuller and better text-books available. The only place we see for it is among the students of the Washington University Medical School, at which the authors are instructors.

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VOLUNTEERS FOR THE MEDICAL CORPS.

IN times of war, when untold sacrifice is demanded of many people, and all people feel, through one means or another, the unrelenting imposition of unusual and necessary demands upon them, the medical profession, trained as it is to instant response to other men's needs, should find itself a leader in volunteering to patriotic service. In the matter of enlistment in the Medical Corps, however, this has not proved the case. The medical departments of the Government, organized for peace conditions, must enormously increase their capacity before they will be able to cope with the military situation brought about by the present war. Their function in the army is to do three things,—examine recruits, look after the hygiene of the camp and care for the wounded. To do these things adequately for the army soon to be in training will require from 10,000 to 12,000 physicians, and the number of men enrolled is far below this requirement. The surgeons-general have not as yet been given full authority and means whereby to enter upon their duties, and until the ranks of the departments are filled, the authority and means can be of little use. The service is recruited solely by volunteers, and with the President ready to confer authority and Congress ready to provide the means, there is lacking only the spirit of service among the profession.

It is to the younger physicians that the appeal is principally directed. Men who graduate at this time can enter the Medical Corps directly. Men who have graduated and have had one year's hospital training and are younger than 32 years of age, can enter the Medical Corps of the Army. For the Medical Reserve Corps or the new Officers' Reserve Corps, there is need of men who have graduated in the last five years, especially those who have had hospital experience. The older men of the profession can do much toward encouraging and stimulating the young men, more especially those not yet firmly anchored by family ties, promptly to enlist in the Reserve Corps; or if their education and training have been sufficiently broad, they may join the regular Army or Navy. It is unquestionably true that the advantages offered by the Medical Department of the Army and Navy, both for patriotic service and for rapid promotion, have not been before, and will not soon again, be paralleled.

In another column of this issue of the JOURNAL we publish further information issued by the United States War Department regarding appointment in the Medical Reserve Corps of the United States Army. We publish also the personnel of the examining boards for the Medical Reserve Corps in New England and New York. Physicians intending to join the Reserve Corps may obtain the necessary blanks by writing to the surgeon-general of the United States Army at Washington; and when the applications have been made out, should forward them to the nearest chairman of the examining boards, who will make appointment for the applicant to appear for the examination.

AMERICAN OCCUPATION OF BRITISH FIELD HOSPITALS.

After being royally welcomed and entertained by the enthusiastic English, the Americal hospital units for foreign service crossed the Channel and quietly took possession of six of the British field hospitals in France, thereby releasing the British staffs for duty near their fronts. The hospitals have been located on carefully selected sites and have been developed and perfected to a high degree of efficiency in their three years of existence. Some of the hospitals are made up of tented wards, accommodating forty to sixty beds each; others are constructed of a series of huts, and operating theatres lack nothing in the way of modern surgical equipment. Originally planned for 1040 beds each, most of the hospitals can care for 1400 beds in an emergency, and some have accommodated 2000 patients in a crisis.

The first of the American units to reach France was known as United States Base Hospital No. 4, and was organized in Cleveland by Dr. George W. Crile, with Major Gilchrist of the United States Army as commanding officer. This unit has taken over British General Hospital No. 9, "somewhere in France." United States Base Hospital No. 5, organized at Harvard University by Dr. Harvey Cushing, with Major R. U. Patterson as commanding officer, has taken over British General Hospital No. 11; United States Base Hospital No. 2 from the Presbyterian Hospital, New York, organized by Dr. George Brewer, with Major Lucius P. Hopewood commanding, has taken over British General Hospital No. 1; United States Base Hospital No. 21, organized in St. Louis by Dr. Frederick Murphy, with Major James D. Fife commanding, has taken over British General Hospital No. 12; United States Base Hospital No. 10, organized in Philadelphia, largely in the University of Pennsylvania, by Dr. Richard Harte, with Major M. A. Delaney commanding, has taken over British General Hospital No. 16; United States Base Hospital No. 12, organized in Chicago by Dr. Frederick Besley, with Major C. C. Collins commanding, has taken over British General Hospital No. 18, all of course being "somewhere in France." To these may be added the Harvard Unit, which for over a year has been in charge of British General Hospital No. 22.

Each unit has an organizing director who was a surgeon in civil practice but now takes command as a major in the United States Reserve. The commanding officer in each unit is a regular American Army surgeon while the subordinate members of the staffs are made up of Regular Army surgeons and doctors commissioned from civil life. The nurses are all graduates from well-known training schools and the non-commissioned orderlies and privates were practically all taken from civil life. Each American hospital staff has also organized a mobile unit for service in the casualty clearing stations, just back of the firing lines, for emergency work during the first days of great battles.

WELCOME TO AMERICAN DOCTORS.

The Journal has received a letter from J. Y. W. MacAlister, secretary of the Royal Society of Medicine, inviting most cordially all American doctors who are passing through London to make use of the Society's rooms in Cavendish Square. This is in further expression of the hearty welcome which is waiting for American doctors who are crossing the ocean to help in the war. Dr. MacAlister's letter reads further as follows:

"During their stay on this side we offer them all the privileges of Fellowship gratuitously. We have the finest medical library in this country, and many comforts in the house which make it almost a Club, and nothing would please us better than to see it crowded with our American friends. I have communicated this to some of the leading doctors who have already arrived and gone to France."

Further invitation is extended to attend the meetings which are held for reading of papers, clinical demonstrations and for discussions.

A CANCER DECALOGUE.

In another column of this issue of the Journal (page 62) is published the "cancer decalogue," prepared by the standing committee on the control of cancer of the Massachusetts Medical Society. The attention of members of the Society and of all other physicians is directed to this important statement, whose publication in the Journal will be repeated monthly, by request of the committee.

MEDICAL NOTES.

Fourth of July Preparedness.—In 1903, 415 persons in the United States developed lockjaw (tetanus) following Fourth of July pistol and firecracker wounds. In 1908 there were 76 such cases with 55 deaths, and last year, so far as we can learn, there was only one case of lockjaw due to this cause. Two factors have led to this gratifying decrease in this unnecessary loss of life, namely, safe and sane celebration of Independence Day, and the prompt use of tetanus antitoxin.

The antitoxin, while almost infallible as a preventive of lock-jaw, has had but little value, as ordinarily used, in fully developed cases. Inasmuch as the disease so often follows Fourth of July pistol and firecracker wounds, it is of the utmost importance to have tetanus antitoxin injected promptly after the injury.

The New York Department of Health has for some years supplied tetanus antitoxin free of charge, and on request will even send a trained physician to inject the remedy. Not a single case of lock-jaw has occurred in any of the cases promptly injected.

The attention of physician readers is again called to the treatment of developed cases of tetanus by means of spinal injections of tetanus antitoxin.

The prevalence of Fourth of July tetanus in the United States is shown in the following table:

1903	415 cases		
1904	105 cases		
1905	104 cases of which	87 died	
1906	89 cases of which	75 died,	10 in New York City
1907	73 cases of which	62 died,	5 in New York City
1908	76 cases of which	55 died,	6 in New York City
1909	150 cases of which	126 died,	7 in New York City
1910	72 cases of which	67 died,	4 in New York City
1911	18 cases of which	10 died,	3 in New York City
1912	7 cases of which	6 died,	2 in New York City
1913	4 cases of which	3 died,	2 in New York City
1914	6 cases of which	6 died,	3 in New York City
1915	4 cases of which	4 died,	3 in New York City
1916	1 case of which	1 died,	1 in New York City

Prevalence of Diseases in the United States.—The weekly report of the United States Public Health Service for June 22, 1917, states that during the month of May there were forty-three cases of cerebro-spinal meningitis in Maryland, twenty-four in Wisconsin and twenty-four in Massachusetts. During the same period there were in Massachusetts nine cases of poliomyelitis, and seventy of typhoid fever. There were eighty-one cases of typhoid fever in Maryland and eighty-three in West Virginia. There were 158 cases of smallpox in Wisconsin.

The number of poliomyelitis cases in the United States reported thus far this year is exceptionally low. The total number reported in the entire country for the month of May was only nineteen. Massachusetts led with nine cases. During the first week in June there were six deaths, two in Massachusetts, three in New York and one in New Jersey. Three cases were reported from Ohio, three from New Jersey and one each from New Hampshire, Wisconsin and Missouri.

Decrease in Mortality from Pellagra in 1916.—The experience of the Metropolitan Life Insurance Company, which has a large number of policy holders in the section of the country where pellagra prevails, contains sidelights on the progress of this disease during recent years.

In recent years pellagra has very rapidly increased in importance as a cause of death. In 1911, the number of deaths in the company's experience was only 277; in 1915 this number had increased to 650. During this period the rate had increased from 3.6 per hundred thousand exposed persons, to 6.7. In 1916 the number of deaths dropped to 368, and the rate to 3.6 per 100,000, exactly the same as in 1911.

The insurance company's statistics make possible a number of interesting deductions with reference to the characteristics of this disease. The very remarkable drop in the rate in 1916 appears to bear out the tentative conclusions of the Government experts who are now studying pellagra, namely, that the disease is not of infectious origin but is probably one of the so-called "deficiency" diseases induced by insufficient, poorly balanced dietaries. The year 1914 and the first half of 1915 were periods of depression in the cotton belt and this was reflected by higher pellagra rates. In the latter part of 1915, and in all of 1916, prosperity prevailed, and the industrial and agricultural communities of the South enjoyed a more abundant and varied ration. Future observation and experiment by Government authorities will probably definitely determine whether this explanation of the declining death rate of the disease is entirely satisfactory.

The disease is much more prevalent among the colored people than among the whites, and is much more frequent among females than among males. Thus, in the five-year period, 1911-1915, the rate among colored females was highest, 20.3 per 100,000; among the colored males it was 6.4; among the white females, 4.2; and among white males, the least of all, 1.7 per 100,000. It would be very interesting to learn why females in this country have, approximately, three times the pellagra mortality rate of males. Another interesting fact is that the incidence of the disease increases with age. There is no exception to this fact up to age 65. After 65, the rate remains fairly stationary.

Early reports for 1916 which have come from the health authorities of certain of the Southern states are in general agreement with the encouraging insurance figures referred to above. There is in effect good indication that the measures instituted by the U. S. Public Health Service, and the hypothesis upon which their work has been planned, are sound, and we may confidently expect that this comparatively new scourge will soon be under control.

WAR NOTES.

Prevention of Tuberculosis in the Army.—It is announced that Col. George E. Bushnell, commandant of the General Hospital, Fort Bayard, N. M., which is the government hospital for the care of tuberculous soldiers, has been ordered to Washington to institute measures designed to safeguard American troops against contracting tuberculosis. Colonel Bushnell was born in Massachusetts in 1853, graduated from Yale in 1876 and Yale Medical School in 1880. He served through the Spanish War as a major chief surgeon and received his commission as colonel in 1911.

Emergency Hospitals.—President Wilson has sent to Congress a recommendation by Secretary Daniels for an appropriation of $2,200,000 to be used in building emergency hospitals. Temporary hospitals are nearing completion at Portsmouth, N. H., Philadelphia, Newport, Norfolk, Charleston, Pensacola and New Orleans and plans have been made for the erection of similar hospitals at New York, Annapolis, Jamestown, Quantico, Va., Key West, the Great Lakes, Mare Island and Puget Sound.

A Draft for Army Doctors.—The New York Committee for National Defense, in a report to the central council at Washington, has urged a system of drafting doctors for the medical corps of the Army. The failure to obtain, through volunteering, anywhere near the necessary number of surgeons, has resulted in an effort on the part of the Committee to urge a selective draft of all available physicians. The Committee states that of the 140,000 doctors in the United States, less than one-half are available and desirable for military purposes, and that the policy of allotting or urging physicians to volunteer indiscriminately in the great numbers needed as medical officers for the war, is sure to result in confusion, waste and failure. The draft, based upon special classification by census, would accomplish the desired result by bringing into the army those best fitted for its uses and by leaving at home the physicians needed by the community.

Re-education of Crippled Soldiers.—A conference of ten representative physicians has laid before the Council of National Defense recommendations for the establishment of a system of re-education and rehabilitation for men who may be maimed or crippled in the war. The physicians who framed the report are Drs. James Bordley, Jr., Baltimore (ophthalmology); John Staige Davis, Baltimore (plastic surgery); C. R. Dooley, Pittsburgh (vocational education); S. I. Franz, Washington (neurophysiology); F. B. Gilbreth, Providence (management engineer); R. W. Lovett, Boston (orthopedic surgery); Harris P. Mosher, Boston (otology); T. H. Weisenburg, Philadelphia (neurology); W. A. White, Washington (psychiatry), and Edwin W. Ryerson, Chicago (orthopedic surgery).

A study of the situation has shown that of the whole number of maimed men, at least 80 per cent. can be trained to new occupations if their physical defects receive immediate treatment after they have left the army hospitals and their training is given proper attention. From 70 to 80 per cent. of the wounded returned to Canada have needed reconstruction work. The conference recommends that a permanent commission be formed to lay plans for the proper organization of the work.

Standardization of Military Medical Supplies.—The Council of National Defense has compiled a set of catalogues of staple medical and surgical supplies selected to meet war conditions and listed for the purpose of standardizing such supplies. In the opinion of the Committee it is highly desirable that wide publicity be given its work with regard to this standardization. The first catalogue issued under its supervision is Part I, covering surgical instruments, and this will be mailed gratis to all interested physicians and surgeons upon application to Major F. F. Simpson, M.O.R.C., Chief, of Medical Section, Council of National Defense, Washington, D. C. Other catalogues in preparation are:

1. Medicines, Disinfectants, Anaesthetics, Chemicals, etc.
2. Hospital Equipment and Supplies.
3. Laboratory Apparatus.
4. X-Ray Apparatus.
5. Dental Instruments and Supplies.

Such a standardization of supplies will result, it is expected, in insuring for the needs of the medical services of the Army and Navy, the Red Cross and civilian hospitals sufficient amounts of these supplies even under the abnormal conditions of war. The committee is assured, by thus selecting a minimum number of staple and essential articles, the maximum and economical production of such articles. It has been agreed by the manufacturers that their production shall be given precedence over other articles for similar purposes.

Assistance for Tuberculosis in France.—Dr. Livingston Farrand, president of the University of Colorado, and director of the mission to be sent by the Rockefeller Foundation to render aid in the control of tuberculosis in France, makes the following statement regarding the prevalence of the disease in that stricken country:

"The French death rate from tuberculosis is, roughly, twice that of America and three times that of England. Normally France has a high death rate and a low birth rate, and with the increase in tuberculosis brought about by the war it is evident that something must be done and without delay.

"It is estimated, say the reports to the Rockefeller Foundation, that in the three years of the war 150,000 soldiers have been discharged from the French Army because of active tuberculosis. Nor is this condition confined to the army. Refugees from the occupied districts of Northern France are breaking down in large numbers and the French prisoners returned from Germany indicate a high percentage in that group.

“Since the war began, a special commission has been created to care for tuberculous soldiers. This work is of the greatest importance and must go on. It is doubtful, however, if at the end of this year there will be more than 10,000 or 12,000 beds available for tuberculous patients in the whole of France, and these will be occupied almost exclusively by soldiers.

“A conservative estimate would indicate that there are 500,000 cases of tuberculosis in the country. It is obvious that, whatever preventive measures can be laid down and followed out in the future, an immediate need is for hospital accommodations, and there is no more pathetic appeal to which the wealthy people of America could respond.”

American Hospitals in England.—The American Women's War Relief Fund, whose president is Lady Paget, has made arrangements that its two hospitals, one at Lancaster Gate, London, and the other at Paignton, be used for the care of American soldiers. Although established for the care of the British soldiers, with the entry of America in the war these American women in England wish these hospitals to be always open for such Americans as may need their services.

“Lady Paget has been foremost in her charity work since the outbreak of hostilities. She has gathered from America 3,500,000 socks and these, with tens of thousands of garments such as underwear, pajamas and shirts, have been sent to British fighting men in need of them. Lady Paget, personally, has raised in America and England $1,250,000 for British wounded, $175,000 for Russian wounded, $160,000 for French wounded and $125,000 for American hospitals in England.

Others associated with her in the American Women's War Relief Fund are Mrs. John Astor, vice-president, the Duchess of Marlborough, chairman, and Lady Lowther and Mrs. Harcourt, who are secretaries. The nine American women who make up the executive committee are headed by the wife of the American ambassador, Mrs. Page. Lady Randolph Churchill is chairman of the hospital committee, while the chairman of the economic committee is the Duchess of Marlborough.”

Hospital Units for Nervous and Mental Disorders.—The National Committee for Mental Hygiene has created a subcommittee on furnishing hospital units for nervous and mental disorders to the United States Government, the project having been approved by Surgeon General W. C. Gorgas of the U. S. Army.

This subcommittee, of which Dr. Pearce Bailey of New York is chairman, is authorized to secure the services of alienists and neurologists to be commissioned in the Officers' Reserve Corps, Medical Section, and to serve in the neuro-psychiatric units which are to be attached to the base and other hospitals of the military services of the United States. Further information will be given, and application forms sent to physicians qualified in this branch of medicine, on application by letter or in person to The National Committee for Mental Hygiene, 50 Union Square, New York City.

Dearth of British Medical Officers.—In the issue of the *Lancet* for June 2 appears the following paragraph relative to the dearth in the supply of medical officers for the British Army and the expectations entertained for the making up of this deficiency by American physicians.

“The Central American War Committee has been working steadily and at great pressure to meet the demands of the War Office for medical officers for the Army, and the position indicated in these columns some time ago as imminent has clearly been reached. In existing circumstances all the War Office demands cannot be met. The information that a large number of American medical men will shortly be available for service in France has been considered by many to promise an amelioration of the situation, but there is as yet no definite and official warrant for believing that the problem of an adequate supply of medical officers for the British Army will be solved in this way. Undoubtedly there are American medical men promptly available to serve for the time being with our Army or with the French Army, and probably more of the same gallant assistance will be forthcoming. Recognition of the qualifications of these American confrères by their Medical Association or statutory Colleges would enable them to be at once available for the armies at the Allied fronts. But these American doctors would probably have to be returned to the American Army when expeditionary forces begin to arrive from the United States. A temporary respite from acute trouble, however, might be gained through the employment of American doctors, and such respite would be valuable to this country where the supply of medical men has become so dangerously short. The subject is now under the discussion of the Central Medical War Committee. No one who is aware of the circumstances in which exemption is refused or obtained by our medical men of military condition can possibly suggest that the Central Medical War Committee takes other than a very high view of its responsibilities towards the Army. It has, however, an enormously important duty towards the civilian population in this country, and cannot be blind to it. So closely have the areas in England been scrutinized with a view to obtaining every medical officer for the Army, so intensive is the method of investigation and reinvestigation now being conducted, that it seems certain that should all this energy and self-sacrifice not bear sufficient fruit, the Army will have to economise in the employment of medical men under some plan of redistribution or reorganization. There are already men being sent into the Army who can badly be spared by the State."

Women's Medical Unit.—The first unit of women physicians for foreign service has been organized. Dr. Florence N. Ward, a surgeon of San Francisco, is chairman of the organization and Dr. Cornelia C. Brant, dean of New York Medical College and Hospital for Women, is treasurer. The unit includes women surgeons from all parts of the United States.

War Relief Funds.—On July 7, the totals of the two principal New England war relief funds reached the following amounts:

French Wounded Fund	$235,898.43
Surgical Dressings Fund	103,713.47

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending June 30, 1917, the number of deaths reported was 242, against 214 for the same period last year, with a rate of 16.34, against 14.86 last year. There were 37 deaths under one year of age, against 37 last year, and 66 deaths over 60 years of age, against 62 last year.

The number of cases of principal reportable diseases were: diphtheria, 65; scarlet fever, 32; measles, 183; whooping cough, 12; tuberculosis, 137.

Included in the above were the following cases of non-residents: diphtheria, 8; scarlet fever, 8; measles, 3; tuberculosis, 8.

Total deaths from these diseases were: diphtheria, 8; scarlet fever, 2; measles, 8; tuberculosis, 22.

Included in the above were the following deaths of non-residents: diphtheria, 1; scarlet fever, 1; tuberculosis, 1.

Long Island Hospital Graduation of Nurses.—On June 28, the training school of the Long Island Hospital graduated seventeen nurses. Chairman Thomas A. McQuade of the institution trustees administered the Florence Nightingale oath to the graduates, and Mrs. William McNamara of the National Civic Federation spoke on "Opportunities in Industry for Graduate Nurses."

Infantile Paralysis Fund.—The fund of the Harvard Infantile Paralysis Commission has now reached a total of $13,919.95.

Dedication of Winchester Hospital.—The newly erected Winchester (Mass.) Hospital, the cost of which was raised by popular subscription, was dedicated on June 28 in the presence of more than one hundred and fifty people. The building contains sixty beds, eight private rooms and two sun rooms.

Massachusetts Health Department and Alcohol.—The recently issued May number of the Public Health Bulletin of the Massachusetts State Department of Health gives the following notice to the subject of alcohol.

Recently Dr. Haven Emerson, Commissioner of Health of the city of New York, has twice come to Boston, first to address a meeting called by the alcohol committee of the Associated Charities, and later, a group of doctors and their wives, in regard to the effects of alcoholic drink on the health of the community. The information given by Dr. Emerson and the opinions expressed by the doctors present as to the part played by alcohol as a cause of sickness and death seem to demand that the Departments of Health should give out such information on the subject as they possess, especially the results of the more recent scientific inquiries.

Health departments are not called on to discuss the use of alcohol from a moral or religious point of view, but in so far as it affects the health of individuals and of society at large, the community has a right to expect the doctors and the health departments to give the facts, together with sound and reliable opinions; to tell the truth, the whole truth and nothing but the truth.

It is quite as important that the public should be correctly informed as to the effects of alcohol as it is that they should know the facts about tuberculosis and syphilis.

The amount of alcohol in patent medicines should be generally known.

We know now that alcohol is not a stimulant, but is a depressant; that its excessive use frequently causes insanity; that used even in moderation it more or less impairs the nervous system so that impressions are less clear and actions less accurate, thus causing innumerable accidents to the individuals and other innocent persons.

Alcohol causes damage to the heart, kidneys and blood vessels, as well as to the stomach and liver. Owing to its effect on the germ plasma it often damages the unborn babe. It reduces the resistance to bacterial infection, thus rendering individuals more susceptible to tuberculosis and other infections. Regular drinkers have a decidedly smaller chance of recovering from pneumonia. These subjects may be taken up more in detail in later numbers of the Bulletin.

The more we know about disease the more clearly we see that preventive medicine is most important for human welfare; for suppose a part of the body has been impaired or destroyed by syphilis or alcohol,—such destruction might have been prevented, but usually cannot be repaired.

NEW ENGLAND NOTES.

Fund for Concord (N. H.) Hospital.—By the will of the late Dr. Ferdinand A. Stillings of Concord, N. H., the Margaret Pillsbury Hospital of that city is to receive a fund, the income of which is to be used for the purchase of surgical instruments. Dr. Stillings' own instruments were given to the Woman's Memorial Hospital.

Infantile Paralysis in Vermont.—On June 29 the total number of cases reported in Vermont had reached twenty-four. All but one are in Washington County.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

Essex South.—The Executive Committee of the Essex South Medical Society at the annual meeting of the Society, May 9, 1917, was authorized to outline a course of action for the Society to follow that would aid those of our number about to enter the Government Service and that would tend to conserve their practice.

The Committee, after carefully considering the question, desires to submit the following recommendations:

1. One-half of the entire amount collected from the practice of an absentee, with the exception of lodge work, shall be paid to some designated person, preferably a bank official, for distribution to the absentee's family. Whoever serves as treasurer shall keep an accurate record of all money received and an accurate list of those from whom the money comes. The treasurer may also collect to advantage all unpaid accounts. The secretary of the Society shall have access to the lists at all times.

2. Every physician should agree not to visit professionally any of absentee's patients for at least six months after his return, without his knowledge and consent.

3. Each city in the district should take action on the question and decide how best the local situation can be met. The Committee feel that all physicians, irrespective of society affiliations, should take part in any action taken. A committee will be asked in each city to bring the physicians together.

4. Any agreement made should be signed by all the physicians in each city. A copy of the agreement should be in every office and the local papers should print the agreement with the signers.

The Committee realize that the suggested arrangement can apply only to those in general practice. It is suggested that those doing special work make an agreement among themselves. In case of doubt as to whom the patient belongs, the absentee should be given the benefit of the doubt.

Dr. J. A. Shatswell, *Chairman*,
Dr. D. J. Finnegan,
Dr. J. F. Donaldson,
Dr. P. P. Johnson,
Dr. H. P. Bennett.

Obituaries.

COLONEL GEORGE D. DESHON.

Col. George D. Deshon, chief medical officer on the staff of General Clarence R. Edwards, commander of the Department of the Northeast, died suddenly at his home in Brookline, Mass., on June 24. Col. Deshon, whose record for service during the Philippine and Cuban campaigns had established, in military circles, his reputation for a brilliant officer, was asked by General Pershing to take command of his medical staff in France, which position he was obliged to refuse because of ill health.

Col. Deshon was born in Brookline, August 5, 1864, and attended Dartmouth College. From there he entered West Point and, upon the completion of his course there, was appointed to the same regiment with General Edwards, the 23d Infantry, at Fort Wayne, Ind. Shortly after his marriage he resigned in 1890, and studied medicine at Bellevue Medical College and the University of Pennsylvania. He then re-entered the army as a surgeon and was given the rank of Major. He was sent to the Philippines and achieved distinction. On his return he was appointed commandant of the Army and Navy General Hospital at Hot Springs, Ark. Subsequently he served in different capacities until appointed superintendent of the Ancon U. S. Canal Hospital at Panama. Under his supervision, the eleven army canal posts were brought to as high a mark as any in the government. Upon the transfer of General Edwards to the new northeastern department, Col. Deshon was chosen to accompany him. On arriving at Boston, Col. Deshon was not well, and for about two weeks was at the Massachusetts General Hospital. He did not, however, fully recover his health before he was stricken with death.

Colonel Deshon was a member of the Army and Navy Club, Washington; the Psi Upsilon fraternity, the Society of Colonial Wars in the Commonwealth of Massachusetts, the Massachusetts Society of the War of 1812, Massachusetts Society of the Military and Naval Order of the Spanish War, Massachusetts Society of Sons of the American Revolution and the Society of the Army of the Philippines.

He is survived by a widow and a son, Captain Deshon of the field artillery, who is at the present time on sick leave in California. Of Colonel Deshon, General Edwards said:

"He was a loyal and devoted friend, and the ideal soldier-doctor. I do not believe there was a man of higher character in the United States service than he. Although the strictest kind of a disciplinarian, he was the sort of man that men loved and honored. The loss to the service will be serious."

HERBERT MAXON KING, M.D.

Dr. Herbert Maxon King, who for many years had been physician-in-chief at the Loomis Sanatorium, died there from tuberculosis on June 24. Dr. King was born in Adams, N. Y., on August 11, 1864. He was educated at Dartmouth College and entered the University of the City of New York as a medical student, receiving his degree of M.D. in 1886. After practising for four years in New York, he entered the Marine Hospital service. This he left in two years to go to Grand Rapids, Mich. He soon achieved distinction in his profession, and became a recognized authority in the diagnosis and treatment of all forms of respiratory disorders. In 1897 he visted Paris for the purpose of studying the methods of the French, and upon his return resumed practice in Grand Rapids. In 1902 he was chosen to the position at the Loomis Sanatorium, which he held until his death.

JOHN WILLIAM WATSON, M.D.

Dr. John William Watson, who died at the Deaconess Hospital, Brookline, Mass., of toxemia, following an operation for appendicitis, was born at Lawrence, Mass., July 8, 1870. His college preparatory course was at Phillips Exeter Academy, and he was graduated from Dartmouth College in 1893, and from the College of Physicians and Surgeons at Baltimore, Md., in 1900. He had an A.M. from Dartmouth through post-graduate work. He practised his profession at West Hartford, Vt., at Beverly, Mass., and at South Braintree, Mass. At the time of his death he was a member of the officers of instruction of the Tufts College Medical and Dental Schools and Assistant to the Medical Examiner of the Suffolk South District. He was a Fellow of the American Medical Association and of the Massachusetts Medical Society. He is survived by his widow, his foster daughter, his mother and one sister and a brother.

Miscellany.

TUBERCULOSIS AND ITS RELATION TO THE MOTHER'S AID LAW IN MASSACHUSETTS.*

The Mother's Aid Law in Massachusetts went into effect September 1, 1913. By this law the State, through the State Board of Charity, pays a sum towards the support of children under 14 years of age in dependent families in which the father is dead or incapacitated.

During the first three years of the Mother's Aid Law,—September 1, 1913, to September 1, 1916,—a total of 5052 cases were aided. In 3663 cases, or 73%, the husbands had died, and in 1389, or 27%, the husbands were living, but incapacitated for various reasons.

Two studies have been made of those cases dependent because of the *death* of the husband. The first, a study of 300 cases, shows that 92 husbands died of tuberculosis. The second, a study of 500 cases, shows that 126 husbands died of tuberculosis. This means that 27% of the husbands in these 800 cases died of tuberculosis.

The above studies indicate the percentage aided because the husbands had *died* of tuberculosis. There are also many *living husbands* of women receiving Mother's Aid who are tubercular, cared for in sanatoria or at home under supervision of local boards of health. Of the total of 5052 cases there were 266 of the husbands living but unable to support their families because of tuberculosis.

If 27% of the 800 cases studied is the correct proportion of *deaths* from tuberculosis, for the entire 3663 cases, we find the total number of such deaths to be 989, and adding the 266 cases of tuberculosis among the *living* but incapacitated husbands, we have a total of 1255 cases receiving Mother's Aid because of tuberculosis, or 25% of all the 5052 cases.

According to the estimate made by a state official, the total cost to cities, towns and state of the 5052 cases for the three years has been not less than $1,500,000. The proportion of this amount spent because of tuberculosis is, therefore, in the neighborhood of $375,000.

Besides the tubercular husbands, deceased or incapacitated by reason of tuberculosis, many of the mothers of these families are pre-tubercular or arrested cases of tuberculosis, and many of the children of these families are tubercular.

The problem of tuberculosis, as seen by those who administer the Mother's Aid Law, includes, therefore, the large number of husbands who died in the prime of life, leaving dependent families to be supported out of public funds; a large number of tubercular husbands cared for at public expense in sanatoria or at home through the overseers of the poor and boards of health, and many of whose families must be aided by public funds; and many women and children who are incapacitated for work, and therefore have to be supported by public funds.

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* Statement based on a paper read by [illegible], Supervisor, Mother's Aid, Massachusetts State Board of Charity, at the Massachusetts State Conference of Charities, [illegible], October 27, 1916.

CANCER DECALOGUE PREPARED BY THE STANDING COMMITTEE ON THE CONTROL OF CANCER OF THE MASSACHUSETTS MEDICAL SOCIETY.

1. The classical signs of cancer are the signs of its incurable stages. Do not wait for the classical signs.

2. Early cancer causes no pain. Its symptoms are not distinctive, but should arouse suspicion. Confirm or overthrow this suspicion immediately by a thorough examination and, if necessary, by operation. The advice "Do not trouble that lump unless it troubles you," has cost countless lives.

3. There is no sharp line between the benign and the malignant. Many benign new growths become malignant and should, therefore, be removed without delay. All specimens should be examined microscopically to confirm the clinical diagnosis.

4. Precancerous stage. Chronic irritation is a source of cancer. The site and the cause of any chronic irritation should be removed. All erosions, ulcerations, and indurations of a chronic character should be *excised.* They are likely to become cancer.

5. Early cancer is usually curable by radical operation. The early operation is the effective one. Do not perform less radical operations on favorable cases than you do on unfavorable ones. The chances for a permanent cure are proportionate to the extent of the first operation. Make wide dissections; incision into cancer tissue in the wound defeats the object of the operation and leads to certain local recurrence.

6. Late cancer is incurable, though not always unrelievable. Radium, x-rays, ligation, cautery, or palliative operations may change distress to comfort and may even prolong life.

7. Cancer of the breast. All chronic lumps in the breast should be removed without delay. Benign tumors can be removed without mutilation. Examine all specimens microscopically. An *immediate* microscopical examination is desirable since, if positive it permits a radical operation at the same sitting. A radical operation performed ten days after an exploration is almost never successful in curing cancer of the breast.

8. Cancer of the uterus. Any irregular flowing demands thorough investigation. Offensive or even very slight serous flows are especially suspicious. Curette and examine microscopically. Amputate all eroded cervices which do not yield promptly to treatment. Do not wait for a positive diagnosis.

9. Cancer of the digestive system is difficult of early diagnosis, and therefore unfavorable in prognosis. All persistent and recurring indigestions (more especially if attended by change of color and loss of weight) and any bleeding or offensive discharges demand prompt and thorough investigation. Do no wait for a positive diagnosis.

10. Cancer of the skin. Any warts, moles, or birthmarks which enlarge, change color, or become irritated should be removed promptly. They are likely to become cancer. Do not wait for a positive diagnosis.

INFORMATION REGARDING APPOINTMENT IN THE MEDICAL RESERVE CORPS OF THE UNITED STATES ARMY.

Applicant must be a citizen of the United States, between 22 and 55 years of age; a graduate of a reputable medical school; must have qualified to practise medicine in some state; and must be in the active practice of his profession. "Active practice" includes those who specialize in eye, ear, nose and throat, dermatology, neurology, obstetrics, etc.

The Act June 3, 1916, creating the Medical Officers' Reserve Corps, provides that in time of peace only those of the grade of first lieutenant may be ordered to active duty, and this with their own consent, but in time of war the services of officers of all grades are at the disposal of the government.

PROCEDURE.

(*a*) Fill out personal application blank; write distinctly.

(*b*) Certify to the application before a notary public or other person authorized to administer oaths. This is essential.

(*c*) Secure letters of recommendation from two prominent citizens who know you; these may be from physicians. Attach these letters to the application.

(*d*) Write to the examining board most convenient to you and arrange to present yourself for examination at such time as may be mutually agreeable. Do this as soon as possible.

(*e*) When you report to the board for examination, present to it your application blank, properly filled out and certified to as indicated above, your testimonials, your state certificate and, if of foreign birth, documentary evidence of your full citizenship.

EXAMINATION.

The examination is physical and professional. The minimum physical requirements are: (*a*) height, 5 feet, 4 inches; (*b*) weight, 120 pounds; (*c*) vision, 20/100 each eye entirely corrected by glasses—no organic disease.

The professional examination for the Reserve Corps is not severe; it is oral and practical in character, and in case of failure is supplemented by a written examination.

MEDICAL CORPS.

A physician may be commissioned in the Medical Corps of the Army, provided he is between 22 and 32 years af age (34 up to Jan. 1, 1918), a citizen of the United States and a graduate of a reputable medical college legally authorized to confer the degree of Doctor of Medicine. He must have had also at least one year's hospital training subsequent to graduation, including practical experience in the practice of medicine, surgery, and obstetrics, and will be expected to present evidence to that effect. Whether or not he is married has no effect on his eligibility to the Medical Corps. He must pass a preliminary examination and a final or qualifying examination in accordance with the rules and regulations, which may be obtained on application.

Examining Boards for Medical Reserve Corps.

The following is a list of medical boards as appointed up to June 5. The name and address of the chairman of the board only is given. It is presumed that applicants will select the board most accessible to themselves, even though this may mean a board in another state:

Connecticut: New Haven, Lieut. John W. Churchman, M.R.C.

Maine: Brunswick, Lieut. F. N. Whittier, M.R.C., Bowdoin College; Ft. Williams, the Surgeon; Portland, Dr. William L. Cousins, 231 Woodford Street.

Massachusetts: Boston, Major Horace D. Arnold, M.R.C., Harvard University Graduate School of Medicine (President); Ft. Banks, the Surgeon; Springfield, Lieut. Charles F. Lynch, M.R.C., 387 Main Street.

New Hampshire: Hanover, Capt. Percy Bartlett, M.R.C.; Manchester, Capt. J. Franklin Robinson, M.R.C.; Nashua, Lieut. A. W. Shea, M.R.C.

New York: Albany, Major Henry L. M. Shaw, M.R.C., 361 State Street, President; Buffalo, Capt. Herbert A. Smith, M.R.C., 566 Delaware Avenue; Plattsburg, the Surgeon; New York, Major Henry C. Coe, M.R.C., Academy of Medicine, 17 W. 43d Street, President (office hours, 3 to 5 p.m. every day except Saturday and Sunday); New York, Dr. Simon Flexner, 150 E. 61st Street; Rochester, Major John M. Swan, M.R.C., 457 Park Avenue; Syracuse, First Lieut. Brewster Donst, M.R.C., 641 Park Avenue.

Rhode Island: Newport, Lieut. Charles D. Easton, M.R.C., 36 Ayrault Street; Pawtucket, Capt. James L. Wheaton, 210 Main street; Providence, Major John W. Keefe, 262 Blackstone Building.

Vermont: Ft. Ethan Allen, the Surgeon.

THE AMERICAN MEDICAL UNITS.

In the issue of the *British Medical Journal* for May 26, 1917, appears the following account of the reception of the early medical units of the United States Army upon their arrival in England:

"The first element of the United States army to arrive in Europe is a medical unit, which reached a British port last week, and will leave for the war zone very shortly. The unit consists of 23 medical men, in addition to the major and adjutant, both of whom belonged previously to the United States regular army; 65 trained nurses, and 155 orderlies, as well as four lady stenographers and others serving in subsidiary capacities, including a drum and bugle corps. It was organized for Red Cross work by Dr. George W. Crile, professor of clinical surgery at the Western Reserve University, Cleveland (who has already gone to France), and it has been placed under the command of Major Henry L. Gilchrist, chief surgeon of the 11th Division (22,000 troops) of the United States Army. Major Gilchrist was serving on the Mexican border at the beginning of May, and was relieved in order to assume this new command. The order to go to Europe was received on May 3, and by May 6, 288 men had been examined and the 155 orderlies selected from this number and sworn in. During the same period, the organization, which had originally been voluntary, was made a part of the regular army; every officer, nurse, and orderly has signed on for three years in the regulars and four years in the reserve. All the medical men in the unit, apart from Major Gilchrist and Captain Tuttle, the adjutant, are connected with the Western Reserve University, and in addition to Dr. Crile, they include Major Hoover, professor of medicine; Captain Karsen, professor of bacteriology; and Major Lower, of the Mount Sinai Hospital. Nearly all the professors of the medical faculty of the university are among the contingent. The nurses are mostly college women, many of them from wealthy families in the West, and 90% of the orderlies are also college graduates or undergraduates from the best universities of the

Middle West, principally Ohio. Had it been authorized, a thousand such could have been enlisted at once. The unit left Cleveland on May 6, arrived at an American port the following day, still in civilian clothes, and donned their khaki uniforms as soon as they were out of the harbor. Classes were started on board, and the men were schooled for ten hours a day. The future plans of the unit cannot, of course, be fully disclosed, but it can be said that they are immediately to take entire charge of one of the large base hospitals, consisting of 1000 beds, and its present staff is to be relieved and re-distributed. It is hoped to devote special study to shell shock cases. Major Gilchrist, who gave these particulars, added that six special units from Boston and other parts of the States, with twenty-three medical men attached to each unit, would be sent, and as the United States had an abundance of medical men—1 in 699 of the population—he did not doubt that many more would be forthcoming. He had heard it stated that in all a thousand doctors would arrive within the next two months. On May 23, at Buckingham Palace, the King and Queen received the medical and nursing staff of the first American medical unit, whose official title is No. 4 Base Hospital, United States Army. Sir Alfred Keogh, G.C.B., Lieutenant-Colonel F. W. Begbie, R.A.M.C., and Miss E. H. Becher, Matron-in-Chief Q.A.I.M.N.S., were in attendance, and the American surgeons were presented to His Majesty by the United States Ambassador. The King, in a few gracious words, expressed his pleasure and satisfaction at meeting the first detachment of the American army which has reached our shores since their country resolved to take its part in the war; it was characteristic of the American nation that the first assistance rendered to the Allies should be in connection with the profession of healing. On the same day a second contingent, comprising 26 surgeons, 60 nurses, and 250 orderlies, arrived at a British port."

Correspondence.

A REMINISCENCE OF DR. HOLMES.

Mr. Editor:—

While recalling some old memoranda and anecdotes, I find some which I take the liberty of sending you as having a general as well as a personal medical interest.

Some years ago perhaps some of your readers recollect the exact date Mr. Reginald Harrison the well known surgeon of Liverpool, whose genial and hospitable acquaintance many American physicians had previously made, paid a visit to Boston at the time of the meeting of the Massachusetts Medical Society. He was taken to the annual dinner and given a seat by the side of Dr. O. W. Holmes.

After the meeting he was walking down the street beside his friend, who will be recognized by the older members of the Dorchester Medical Club as the most amusing of raconteurs, and who reported his guest's experience as follows:

"Very clever fellow, that 'Olmes."

"Yes, he's so considered here."

"Written something, I think."

"Well, yes, quite a number of things."

"I must get something of his to carry home with me. Let's see, what's the title? 'Breakfast in Bed' wasn't it, or something of that sort?"

The account of American peculiarities of manner and customs as given in foreign works is apt to be amusing. The exact text of the following I have lost. I would give several copies of old text books in exchange if I could find it. It was supposed to be in illustration—or proof (?)—of the stimulating effect of a fish diet:

"At certain seasons of the year the Americans gather in large crowds upon the seashore to air their politics, theories, and to feast upon a species of oyster called the clam. When they have gorged themselves with this insidious comestible, they indulge in the wildest of delusions, fall a prey to the most worthless of demagogues and exhibit in a high degree the stimulating effect of a diet rich in phosphorus."

"The lean and cadaverous appearance of the Americans is due to the corn meal upon which they habitually feed."—Extract from an English text book on dietetics.

I am,

Very respectfully,

Springfield, Mass. **ROBERT T. EDES.**

APPOINTMENTS.

HARVARD UNIVERSITY.—*Dr. Roger I. Lee* has been appointed to the administrative board.

Dr. Elliott P. Joslin has been made assistant professor of medicine.

LEO M. LEVI MEMORIAL HOSPITAL.—*Dr. George L. Hoffman*, formerly assistant to Professor W. Kolle, past director of the Institut zur Erforschung der Infektionskrankheiten in Bern, has been appointed director of the newly created department of medical research at the Leo M. Levi Memorial Hospital, Hot Springs, Ark.

UNIVERSITY OF VIRGINIA.—The following appointments have been made at the University: *Dr. Theodore Hough*, acting dean, has been made dean of the medical school; *Dr. James A. Wardell* has been appointed professor of pharmacology and materia medica; and *Dr. John H. Neff*, adjunct professor of genito-urinary surgery.

MARRIAGES.

Miss Anna F. Hurley and DR. FREDERICK J. MCVEY were recently married in Dorchester, Mass. Dr. McVey is a graduate of Harvard Medical School and of the University of Vienna. He is associate professor of diseases of the ear, nose and throat at the College of Physicians and Surgeons.

RECENT DEATHS.

DR. GEORGE A. WEBBER, a veterinarian, died at his home in Brookline on June 26. Dr. Webber was born in Cambridge in 1861, the son of Dr. A. C. Webber. He was educated at Harvard and practised his profession for many years in his native city. He was a member of the Ancient and Honorable Artillery Company.

AMORY CHAPIN, M.D., a retired physician, died at his home in Boston on June 27. He was born in Providence, R. I., and received his early education at St. Paul's School at Concord, N. H. He had long been a resident of Boston, but had not practised his profession for about twenty years. He is survived by his widow.

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Original Articles

THE USE OF THE PRECIPITIN TEST FOR THE DETECTION OF HUMAN BLOOD IN CRIMINAL TRIALS.

By Wm. Royal Stokes, M.D., Baltimore,
and
H. W. Stoner, M.D., Baltimore.*

[From the bacteriological laboratories of the state and city departments of health, Baltimore, Md.]

The literature of American medicine contains only meagre accounts of the use of Uhlenhuth's precipitin test for the detection of human blood stains in criminal cases, and as each new case adds to the precedents so important in legal proceedings, we have thought it worth while to report our experience in several investigations. Before doing this, however, it is necessary to consider the work of Uhlenhuth and others in the development of this test.

The above-mentioned author published his first observation concerning precipitins in 1900,[1] but these referred only to the preparation of a precipitin for egg albumen.

The preparation of a precipitating serum for the detection of human blood was described a year[2] later, and his method at that time was carried out as follows:

Rabbits were injected with about 10 cc. of human defibrinated blood at intervals of from 6 to 8 days until 5 injections had been made. He then prepared a solution of 1-100 of human blood, and mixed 2 cc. of this solution with 2 cc. of a double normal (1.6%) salt solution in a test-tube with a diameter of 6 mm. He then added from 6 to 8 drops of the serum from the rabbit that had been previously injected with human blood, and he obtained a distinct cloudiness. He then used solutions of the serum from many animals, but found that his immune rabbit serum produced no reaction when added to these sera, nor would normal rabbit serum cause a cloudiness when added to the solution of human blood serum.

He then expressed the opinion that this reaction distinguishes human from other kinds of blood.

In a later communication Uhlenhuth[3] announced that this test could be made with dried and even decomposed blood, and he[4] followed this with an account of the use of his method in the detection of human blood stains in medico-legal cases, and the first step in this process consists in establishing the proof that the suspected material is really blood. This is necessary, since human semen, albuminous urine, and ascitic fluid will all give the precipitin test for human albumen.

Having proven the material to be blood by means of the well-known guiaeum test, the demonstration of hemin crystals, and spectroscopic examination, he next proceeds to apply the precipitin test in the following manner:

The suspected material is dissolved in normal salt solution so as to produce a solution which is not distinctly colored, but which foams when shaken. To 4 cc. of this fluid he adds 5 drops of the humanized rabbit serum, and an almost instantaneous clouding ensues, which later settles to the bottom of the tube as a sediment. A control test made with a solution of sheep's blood or that of some other animal must remain perfectly clear, and the rabbit's serum should be so strong as to cause a cloudiness and sediment in a solution of known human serum at a dilution of 1-100. The humanized rabbit serum should be perfectly clear and if cloudy or opalescent it should not be used. The reaction should take place within one hour, and those reactions which take place only after several hours or even as late as 24 hours should not be considered as positive.

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* Recently deceased.

This test is, therefore, a reliable test for the detection of human serum, and having shown by previous tests that the suspected material is blood, the conclusion can be maintained that the material is human blood. One exception must be admitted, however, for the blood of some species of highly organized apes will give this same reaction with humanized serum. This fact is without significance in the usual forensic case.

In a number of medico-legal cases Uhlenhuth was able to obtain positive reactions for human blood with such articles as a blood-stained stick, sand, cotton, a coat and pair of trousers, and a hatchet.

The following results, also obtained by this observer, are condensed by Nuttall[5] as follows:

"(6) Blood stain several years on linen, tested with anti-pig serum, gave a reaction; not so with anti-sheep, anti-horse, anti-human serum. Professor Beumer subsequently informed him that the stain was due to pig blood. (7) Dried blood (1897) acted similarly, also subsequently stated to be pig blood by Beumer. (8) Dried blood mixture (1899), reacted to both anti-pig and anti-sheep serum, diagnosis recognized as correct by Beumer, who, as in the other cases, supplied the specimens without letting Uhlenhuth know what they were until after he reported the result of his tests. (9) Blood-stain on paper found in puddle of blood on a road, reacted to anti-pig serum, a suspicion of murder being thus removed. (10) Blood-stains on penknife and handkerchief, medico-legal case, diagnosis human blood, subsequently confirmed by prisoner, who stabbed a man with a knife, explaining the spots on the handkerchief as due to his own nose having bled. (11) Blood-stains on trousers and shirt, sent from Landgericht Munich, and relating to a case of rape—diagnosis, human blood. (12) Shavings from a blood-stained box, same source as preceding, tests negative with anti-human, anti-sheep, and anti-horse serum, further tests not made, and subsequently discovered that the stains were due to roebuck blood. (13) Blood-stained waistcoat and trousers, the owner being suspected of having killed some sheep, tests negative with anti-sheep, positive with anti-fowl, and it was subsequently proved that he had killed a fowl a day before the sheep-killing. (14) Blood-stained wood shavings from a floor, sent from Braunschweig in connection with a murder case; reaction with anti-human serum; murderer subsequently confirmed this. (15) Two samples of blood-stained cloth sent by Prof. Minovici (Medico-legal Institute, Bucharest), and 11 other articles, all blood-stained, were correctly diagnosed as subsequently reported by Minovici. (16) Blood-stained coat, tests negative with anti-human and anti-pig sera, subsequently proved to be roebuck blood-stains, medico-legal case at Marklissa. (17) Dried blood sent from Luxemburg, diagnosed human, subsequently proved to come from a suicide. The blood had been found in front of a house where the suicide lived, the body having been thrown into the Moselle (whence it was recovered) by his relatives, who wished to keep the fact hidden that the man had committed suicide. (18) Blood-stains on wool fragments from waistcoat and basket for carrying wood, diagnosed as human, confirmed by evidence in court. (19) Blood-stained trousers, diagnosis fowl blood. Prisoner suspected of stealing chickens, had claimed the spots to be due to rabbit blood; microscopic examination of the stains had, however, shown the presence of elliptical corpuscles. Comparative tests made with other avian bloods (goose, duck) showed the reaction to take place much more slowly and feebly with these bloods. (I doubt that such tests to distinguish avian bloods medico-legally can have much value, in view of my results, see p. 200.) The diagnosis confirmed in the course of the trial. (20) Three shirts and a handkerchief in connection with a murder, human blood proved to be spattered on two of the shirts. (21) Blood-stained trousers, shirt, stockings from a murder case at Strassburg Landgericht—diagnosis, human blood, the prisoner having claimed that the blood came from a cow which had knocked off a horn. (22) Blood-stains on numerous articles of clothing were diagnosed to be human and from sheep. It was subsequently proved in court that the man had committed a murder, also that he had slaughtered some sheep two weeks before the murder."

Extensive use has been made of the precipitin test in Calcutta by the Imperial Serologist, Lt.-Col. W. D. Sutherland.[6] The numerous examinations made by him were instituted in connection with various types of murder, assault, robbery, house trespass, rape, suicide, and other crimes, and included 2,643 offenses or alleged offenses. Various substances such as wearing apparel, instruments, tools, weapons, earth, hair, head-gear, stones, wood, and other such things, were examined; in all, 6,566. He found 5,186 specimens blood-stained, 36 with non-mammalian blood, 4,352 with human blood, and 90 with other mammalian blood such as that of the ox, buffalo, sheep, goat, horse, cat and pig.

This author by means of these examinations was not only able to aid in the detection of crime, but was often able to refute false witness of man against his neighbor.

Fowls were used for immunization, and these were found very satisfactory. On the first day of treatment the fowls received 5 cc. of the serum in the right wing vein, on the 4th day 10 cc. in the left wing vein, and on the 10th day 10 cc. in the abdominal cavity. The immunized fowl was bled on the 22d or 23d day. In testing the suspected material a dilution of 1-1000 by means of the foam test in comparison with a similar known dilution of 1-1000 normal serum was used. The contact test with 2 drops of the precipitating serum in the taper tubes was carried out, and a zone of reaction, or a contact ring of cloudiness must appear within 20 minutes.

Sutherland believes that with this time limit and dilution human serum can be distinguished from apes' blood, since the latter, if reacting at all, will not appear until after 20 minutes have elapsed. He made many comparative tests with orang (Simia satyrus), hooluck, (Hylobates niger), siamang (Hylobates syndactylus), lungoor (Semnopithecus mitratus), simpai (Semnopithecus melalophus), macaque (Macacus cynomolgus), pig-tailed monkey (Macacus nemestrinus), slender loris (Nycticebus tardigradus) and rhesus monkey (Macacus rhesus), and human serum. The human reaction took place in five minutes, but when human precipitating serum was used with any of these monkey bloods the reaction was not visible until after the expiration of 20 minutes.

This article closes with a brief résumé of 50 typical criminal cases involving murder, assault, rape, cattle-maiming, riot and other offenses, in which justice was usually done to both the guilty and the innocent.

The work of Wassermann and Schütze[7] was also important in emphasizing the usefulness of the precipitin test in forensic medicine. These investigators examined 23 specimens of blood by this method, and obtained a positive reaction only when humanized rabbit serum was used in connection with human blood.

They gave from 5 to 6 subcutaneous injections of 10 cc. of human serum to rabbits every 2 to 3 days, and bled the rabbit 6 days after the last injection. The suspected material was then dissolved in from 6 to 8 cc. of salt solution and divided into 2 portions. To the first portion 0.5 cc. of the immune precipitating serum was added and to the other a similar quantity of normal rabbit serum was added. This second portion acted as a control, and as additional controls hogs' and sheep's bloods were tested with the immune rabbit serum.

The tests are all incubated at 37° C. for one half to one hour, and only human blood will show a clouding and sediment.

They conclude that "the test for human blood is specific for this blood except in the case of monkeys' blood, when it acts only after a longer time and in lesser degree."

The value of the precipitin test for human plasma protein depends upon its specificity for this particular substance, and its value is enhanced by the demonstration of a general principle applicable to all of the sub-phylum Vertebrata. This principle has been clearly established by Nuttall,[8] who performed an extensive series of experiments bearing upon this subject. These experiments are explained in detail in his interesting book, but a brief reference to his results is necessary in order to show the specificity of the precipitin test.

This observer first injected rabbits with the serum of the animal selected for the specificity tests, the amounts varying between 4 and 10 cc. The injections were usually intraperitoneal and were given at intervals of from 3 to 6 days, from 5 to 10 injections being given.

The antiserum was then obtained from the animal by bleeding and stored until used.

In collecting the bloods from the many animals whose blood was to be tested he used filter paper, and these dried slips were placed in salt solution so as to make a dilution when the blood was dissolved of 1 to 100. About 0.05 of a cc. of the special antiserum was added to 1 cc. of the solution of the blood to be tested, and the formation of a sediment or precipitum was noted, if present, at the end of several hours.

Nuttall's first series of experiments was performed with anti-human serum mixed with the diluted serum of the various orders of the Mammalia, Aves, Reptilia, Amphibia, and Pisces, and his results showed two distinct reactions. A faint or medium clouding occurred in a percentage varying from 4 to 100 with all of the orders of the Mammalia except the Lemuroidea and the Monotremata. This he termed the mammalian reaction, which merely indicated a general relation of the orders of the class Mammalia to each other. None of the many tests made with the other classes of Craniata gave any clouding with the anti-human serum, so that these negative results also confirm the theory of a general relationship between the various members of the Mammalia.

A much more intimate relationship, however, was demonstrated between the various members of the order of Primates, the positive reactions being noted as marked clouding or a complete reaction with the formation of precipitate when human antiserum was used with solutions of these various bloods. All of the 34 human bloods of four races gave a complete reaction, and the highest family of the sub-order Anthropoidea gave a similar result. The Simiidae, including the gibbons, orangs, chimpanzees, and gorillas, therefore, gave the complete reaction towards anti-human serum in 100% of cases.

The Cercopithecidae, including the baboons and macaques, gave 10% of complete reactions, and 8% of marked clouding, thus demonstrating a less intimate blood relationship with man than the higher family type just mentioned.

The next family, the Cebidae, gave only 23% of marked clouding, so that the howling monkeys, the squirrel monkeys, the tee tees, the spider monkeys, and the capuchin monkeys, are less nearly related to Homo sapiens, while the Hapalidae, or marmosets, cannot even claim a speaking acquaintance, since they gave only the less marked general mammalian reaction in 50% of cases.

These experiments are not only of general biological interest, as showing the blood-relationship among animals, but they become important from the medico-legal standpoint when we consider that the complete reaction even with such a strong anti-human serum as 1-100 occurs only with human blood of the two highest families of the anthropoids. This is especially so since dilutions of 1-1000 and 1-10,000 are used in medico-legal tests for human blood, and the reaction must be complete, consisting of a distinct sediment at the point of contact between the solution of blood and the antiserum.

The negative tests also enable the medico-legal expert to exclude the blood of the other members of the vertebrates, since 320 tests with avian blood, 49 tests with reptilian blood, 14 tests with amphibian blood, and 19 tests with piscine blood failed to give a precipitate or even a marked clouding with a dilution of 1-100 of anti-human serum.

The medico-legist is often required to prove the presence of the blood of other animals, and the researches of Nuttall also prove that an antiserum made from the blood serum of one sub-order of the class Mammalia will give a complete reaction only when added to the serum of this same sub-order at a dilution of 1-100.

The anti-serum of the Simiidae and Cercopithecidae reacted completely only with the serum of their own sub-order, and various members of the order Carnivora reacted only according to the same rule. Anti-cat and anti-dog serum, therefore, would react completely only with their own serum and failed to react completely with any of the other sub-orders of the Carnivora, or with members of the other orders of the Mammalia.

Among the order Ungulata anti-pig, anti-ox, anti-sheep and anti-horse serum gave the same results, and many bird and reptile sera acted in a similar manner.

Whittier[9] and Wood[10] have both used the precipitin test in murder trials in this country with positive results.

DESCRIPTION OF METHOD USED.

The method which was used for the detection of human blood in the cases about to be described is that described by Müller,[11] and this method is based upon the formation of a precipitin in a dilution of the suspected blood when this is mixed with the blood serum of an animal that has been injected with the blood serum of a human being. The injections of human serum were first injected intravenously, later subcutaneously, and finally by the intraperitoneal method. When injecting large quantities of serum by the latter method, the method advised by Müller, known as the method of Uhlenhuth, was carried out. The hind legs of a rabbit are grasped by the left hand of an assistant, and the fore legs with his right hand, the head being held downwards. The intestines thus fall as far as possible into the upper portion of the abdominal cavity, and the needle of the syringe is then less liable to puncture the intestine when the injection is made.

Kolmer[12] describes several methods as applicable for obtaining a precipitating serum. Of course the blood serum obtained from any of these methods must be carefully tested as to its titer and not used until it has a titer at least as high as 1-20,000. If the injections recommended are not sufficient, other doses must be given, and the experience of most workers seems to indicate that the third method, known as the slow method, will give the best results. No hard and fast rules, however, can be laid down for the immunization of any particular animal, it being understood that rabbits are used in preparing this serum. The methods described by Kolmer are as follows:

"In preparing precipitins for the purpose of identifying blood-stains, whole blood may be injected. It is better, however, to use serum only, as the immune serum may be used in diagnosis, according to the method of complement-fixation, when the presence of hemolysin is not advisable.

Serum Precipitins (Intravenous Method).—First Method.—Three injections are given—of 5, 10, and 15 cc.—on each of three successive days, and the animals are bled twelve days after the last injection has been made.

Second method.—One injection of 30 cc. of serum may be given, and followed twelve days later by bleeding.

Third Method.—A slower method consists in giving the injections at intervals of a week. After the third dose a few cubic centimeters of blood are withdrawn from the ear, and the serum titrated, as rabbits are most prone to succumb after the third dose, and in many instances the serum is of such strength as to require no further immunization. The animals are bled one week after the last injection has been given.

Doses may be given as follows:

First dose: 10 c.c. serum intravenously
Second dose: 8 c.c. serum intravenously
Third dose: 5 c.c. serum intravenously
Fourth dose: 5 c.c. serum intravenously
Fifth dose: 3 c.c serum intravenously

Fourth Method.—Rabbits may be immunized by making intraperitoneal injections after any of the foregoing methods, and with the same or slightly larger doses.

The following table is a record of the various injections made for immunizing the rabbit from which the immune serum was later taken to test for human blood."

Record of Injections of Rabbits.

Jan. 20, 1914	2.0 c.c.	Intravenous
" 24, "	9.4 c.c.	Subcutaneous
Feb. 3, "	9.5 c.c.	Intraperitoneal
" 7, "	10.7 c.c.	Intraperitoneal
" 14, "	10.0 c.c.	Intraperitoneal
" 19, "	19.0 c.c.	Intraperitoneal
Mar. 2, "	20.0 c.c.	Intraperitoneal

Hydrocele fluid

. After the above-mentioned amounts of human serum had been injected into the rabbit the animal was killed several days after the last dose, and the blood serum was obtained and filtered through a small Berkefeld filter. It is important to have the animal fast for about six hours before obtaining the serum in order to avoid the milky opalescence which often appears in a serum soon after feeding and which cannot be removed by filtration. The serum used for this test must be absolutely clear. The titration of the serum was then made in order to determine its potency, and this was carried out according to the directions of Müller, which are as follows:

"Dilutions of 1-1000, 1-10,000, and 1-20,000, respectively, of the serum or blood against which the immune serum acts are first prepared with physiological salt solution (0.8 to 0.9 per cent.). To 2 cc. of each of these dilutions add 0.1 cc. of the immune serum, without shaking. In the 1-1000 dilution a distinct clouding should appear at once, or, at the most, after one or two minutes; and, after three to five minutes, the beginning of the reaction should be distinctly recognizable in the higher dilutions. The reaction should be fully complete after thirty minutes at the most, at room temperature.

The immune serum may be preserved in sterile, hermetically sealed glass tubes, after filtering through a sterile Berkefeld filter. The serum will be rendered free of bacteria in this way, provided the filter works properly. Care should be taken to avoid using cracked filters.

A safer way is to preserve the serum, unfiltered, by the use of 0.5 per cent. carbolic acid (1-10 volume of 5 per cent. carbolic acid solution) as a preservative.

A solution of the *unknown substance.* Physiological salt solution only should be used as a solvent and diluent for blood-stains, etc. The dilution should be about 1-1000. In the case of blood-spots this is not always easy to estimate. Uhlenhuth gives the following directions for obtaining the proper dilution:

1. The dilution should be almost completely colorless by transmitted light.

2. It should give only a slight cloud on heating with a few drops of nitric acid.

3. It must foam freely on shaking, in spite of the high dilution.

This solution also must be crystal clear, for which purpose filtration may be employed.

Test-tubes, 10 cm. long by 0.9-1 cm. wide. These must be absolutely clean.

A test-tube rack. The rack for 12 tubes devised by Uhlenhuth is very convenient. This has the holes for the tubes bevelled, and permits the test-tubes to hang suspended in the holes. Since the small test-tubes are often of unequal diameter, it is a good plan to select in advance tubes as nearly as possible of the same size. To avoid mixing the tubes, the holes in the rack may be numbered.

Physiological salt solution. Volumetric pipettes, 0.1 cc. graduated in 1-100's (the calibration extending to the point , and 1 cc. and 10 cc. in 1-10's.

Dried blood-clots from various species of animal to serve as controls. Dilutions approximating 1-1000 should be prepared of each of these in the same manner as the unknown substance.

Technic.—The following mixtures are set up in a series of test-tubes:

1. The test proper: 2 cc. unknown solution +0.1 cc. immune serum.

2. Control: 2 cc. salt solution + 0.1 cc. immune serum.

3. Control: 2 cc. diluted blood of that species of animal whose blood is suspected to be present in the unknown solution + 0.1 cc. immune serum.

4. Control: 2 cc. unknown solution alone.

5. Control: 2 cc. diluted blood-serum of a different species of animal from that suspected to be present in the unknown solution + 0.1 cc. immune serum.

The addition of the immune serum to the various solutions is best made by placing the unknown solution into test-tubes first and then with a fine pipette adding the blood serum at the very bottom of the tube so that the solution of the suspected material or the control human blood is floated up over the surface of the serum. This produces a ring of the precipitum very much like the contact test which is made for albumen in urine by adding nitric acid to the bottom of the test-tube and floating the urine on the surface of the nitric acid. This contact ring somewhat resembles the ring of albumen precipitated in urine by the nitric acid contact test.

When the test proper and control No. 3 result positively, and all the others negatively, the presence of the blood or proteid of the species suspected in the unknown is established. If the result is negative, the species to which the unknown specimen belongs has to be determined with the aid of new antisera prepared for each species, and employed in the manner above described.

No test is to be regarded as positive unless, as in the preliminary tests of the immune serum, the beginning of the reaction manifests itself within, at the most, one or two minutes after the addition of the immune serum as a faint, misty cloud at the bottom of the test-tube; and within five minutes, at room temperature, this must become a thick woolly cloud. At the end of another ten minutes a definite precipitate must have formed.

Any cloudiness which develops later than twenty minutes after the beginning of the reaction has no significance. It is to be noted further that the tubes *must not be shaken* during the performance of the test.

If the reaction is carried out as above described, no heterologous reactions occur. The clouding, in other words, is very strictly specific, as Nuttall has shown on the basis of 16,000 blood-tests. Only as between very closely related species—horse and ass, sheep and goats, dog and fox—can any doubt possibly arise. Beef blood and sheep's blood are readily distinguished.

The reaction can be obtained from blood in an advanced state of putrefaction, or from a clot which has been dried for a year.

DESCRIPTION OF CASES IN WHICH THE PRECIPITIN TEST WAS USED.

The first case in which the precipitin test for human blood was used was of the State of Maryland vs. Norman Mabel and James Parroway, which was tried in the circuit court for Cecil County on Wednesday, the 4th of March, 1914. The testimony showed that a brutal murder had been committed upon a well-known white citizen living near Salisbury in Wicomico County. In travelling from the country store to his home the victim was waylaid by the two negroes and struck over the head several times with a corn planter, the assault resulting in the death of this man. A great deal of blood flowed from the wounds of the head, and some of the garments of the suspected murderers were brought to the laboratory for examination. A spot of blood on a button of the left sleeve of the coat of one of the murderers was detected by means of the usual chemical and micro-chemical tests, and 0.4 of a milligram of the blood was scraped from the button and accurately diluted so as to make a dilution of 1-1000, 1-10,000 and 1-20,000. The first dilution was also used as a color comparison for the second test in which no accurate weighings could be made. A spot of blood was also detected on the overalls of one of the murderers, and this spot was cut out and soaked in 2 cc. of salt solution and then diluted to the color of the weighed solution from the button, which equalled a dilution of 1-1000. Other dilutions equalling 1-10,000 and 1-20,000 were then made from this original dilution.

The technic, as described above, was then carried out, including the control tests recommended, and the dilutions of 1-1000 of suspected human blood, as well as the controls, gave a distinct clouding within about two minutes and were distinct at the end of thirty minutes. The higher dilution of 1-10,000 showed a beginning precipitum in about five minutes and was well marked at the end of thirty minutes. The tests were made at the usual room temperature.

The murder was committed for the sake of robbery and about fifty dollars were taken from an envelope found in the inside coat pocket of the victim. His coat was extensively stained with blood, and the envelope addressed to him was found at a short distance from the site of the crime. Dilutions of 1-1000, 1-10,000 and 1-20,000, were made by soaking the blood-stained paper of the envelope in salt solution and comparing the lowest dilution by color to the weighed solution of dried blood of 1-1000. The dilution of 1-1000 and 1-10,000 gave a positive precipitin test, as described above.

In giving the testimony it was admitted that the test might be positive if the blood had been from some of the higher orders of apes, but with that exception the opinion was given that the test was positive for human blood. The finding of blood stains on the button of the coat and the overalls of one of the suspected criminals was considered as important evidence, and the man was convicted of murder and received a long term sentence, but was not hanged.

This murder had stirred up great feeling in the town of Salisbury and a mob attacked the jail and attempted to remove the prisoners. This attempt was thwarted, however, and the prisoners were removed to another county for safe keeping and trial.

While public opinion was still seething, a white woman living just outside of Salisbury reported to the police authorities that while alone in her house she had been attacked by a colored man, who had then made away with a few trifling articles, having not been able to find any money or valuables. Upon investigation the doorpost, the threshold of the door, a satchel and various other articles were found smeared with blood and the woman claimed that she had defended herself with a knife and had inflicted certain wounds upon the negro, who then escaped. It should be mentioned that the woman was married, that her husband was absent from home and had been used to leaving her in the house in a lonely part of the country upon various other occasions. The wood from the door, the blood-stained satchel, a blood-stained corncob, and a blood-stained knife were brought to the laboratory for examination, and the usual tests soon demonstrated the presence of blood upon all of these materials. Some of the blood, however, was dissolved in normal salt solution and examined. Somewhat to our surprise it was found that a number of the shriveled corpuscles contained nuclei, and this was confirmed by stained specimens. It was thought probable that the blood might be from a chicken, and rabbits were immunized with chicken blood. When the blood serum of an immunized rabbit had attained a strength sufficient to produce a precipitin reaction in a dilution of 1-20,000 the blood from these various materials was tested in the usual dilutions of 1-1000, 1-10,000 and 1-20,000. They all gave a marked reaction with the blood serum of the rabbit immunized with chicken blood, and the opinion was then expressed that the blood did not come from a human being but was chicken blood.

There had been a great deal of excitement amongst the public concerning this second alleged criminal attack, but when the woman was confronted with the evidence she admitted that she had staged a murder in order to keep her husband at home, as she thought that such an experience might make him more apprehensive concerning her safety in the future.

No further attempts, therefore, were made to apprehend the criminal, the public excitement subsided, and the husband presumably no longer strayed from his own fireside.

In connection with the above cases we tested some other specimens of blood with the immune serum made from the chicken's blood. These specimens were taken from several different orders of the Aves, including the pigeon, goose and duck. When dried blood was used and the dilution by weight was made, all of these specimens gave strong reactions at a dilution of 1-1000. The specimen from the goose gave a moderate reaction in a dilution of 1-10,000 and those from the duck and pigeon gave a slight reaction with this dilution. When blood serum was used instead of the dried blood the dilution was of course four times as weak, as blood loses three-fourths of its weight in drying. In this case the chicken serum with its homologous serum gave a strong reaction at a dilution of 1-100 and a moderate reaction at a dilution of 1-1000, and this result was also obtained when turkey serum was tested. When duck serum was tested the reaction was strong at 1-100 and weak at 1-1000 and when duck and pigeon sera were used the reaction was moderate at 1-100 and weak at 1-1000. It can be seen from these experiments that there is a well marked group reaction present amongst these different orders of the Aves.

The third case in which the precipitin test was used was carried out by Mr. W. A. Gunther, Director of the Co-operative Laboratory of the State Department of Health in the first sanitary district at Cumberland, Md., and we are indebted to him for the following information:

On the evening of November 26, 1915, Watson Howell was killed, or committed suicide, in a saloon located at Reynolds. The state claimed that Howell at six o'clock in the evening was perfectly sober and was found three hours later with a bullet hole in his head, and his face and head covered with bruises and abrasions. They also claimed that the body had been moved for some distance from the spot where it fell, and this was denied by two men present in the saloon at the time, who claimed that they were asleep at the time of the shooting, which awakened them. There was a smear of blood about six feet long on the floor at the place where the man's head was lying. Scrapings of the blood stains were taken one foot apart, and dilutions of antihuman serum from 1-1000 to 1-20,000 were used. The highest dilution which gave a positive reaction was 1-16,000. The possibility of the blood having come from anthropoid apes was admitted, but with this exception it was testified that the blood must have been of human origin. The testimony was admitted as evidence, but the accused was acquitted.

The data upon the last case were also furnished by Mr. Gunther. Tony Mino was accused of having stabbed Carmelo Manone on August 17 in the subway of the Western Maryland Railroad at Cumberland. The victim died within twenty-four hours, and the prisoner was soon captured by bloodhounds. A stiletto was found about fifty feet from the place of capture. The prisoner's coat and cap contained a number of spots which gave the usual tests for blood. The highest dilution at which a positive precipitin reaction was obtained with antihuman serum was 1-9000, but the statement was made that the blood was either that from a highly organized ape or from a human being. The prisoner was convicted and sentenced to eighteen years in the penitentiary.

CONCLUSIONS.

The precipitin test for the detection of human blood is highly specific, and the work of Nuttall shows that anti-human serum even in as low a dilution as 1-100 will cause a reaction only in the presence of human blood or that of certain higher types of apes. There is some difference in the dilutions which have been recommended by various workers, but the dilutions of 1-1000, 1-5000, and 1-10,000, as recommended by Kolmer[13] would seem to be reliable indications of the presence of human blood or that of highly organized apes. This is usually satisfactory for use in criminal cases, but an occasion might arise in which it would be necessary to distinguish between monkey and human blood. For this reason it seems desirable that an accurate set of experiments should be performed in order to ascertain, if possible, a dilution of anti-human serum which is always positive for human blood and always negative for the blood of apes. It is true that Sutherland believes that the latter can be differentiated from human blood by the fact that the reaction will not appear until after twenty minutes, but this should be confirmed and the conclusion would certainly be strengthened by invariable differences of dilution between human and ape's blood. Dried blood should be used for making such tests as it is practically always the only kind obtainable in criminal cases.

REFERENCES.

[1] Uhlenhuth: Deutsche med. Woch., No. 46, Nov. 15, 1900, p. 734.
[2] *Ibid.*, No. 6, Feb. 7, 1901, p. 82.
[3] *Ibid.*, No. 17, April 25, 1901, p. 260.
[4] *Ibid.*, No. 37, Sept. 11, 1902, p. 659; and No. 38, Sept. 18, 1902, p. 679.
[5] Nuttall: Blood Immunity and Blood Relationship, Cambridge University Press, 1904, p. 386.
[6] Sutherland: Ind. Jour. Med. Research, Vol. iii, No. 2, October, 1915, p. 205.
[7] Wassermann and Schütze: Ber. klin. Woch., Vol. xxxviii, No. 7, Feb. 18, 1901, p. 187.
[8] Nuttall: *loc. cit.*
[9] Whittier: Amer. Med., Vol. iii, p. 96.
[10] Wood: Boston Medical and Surgical Journal, Vol. cxlvi, p. 427.
[11] Müller's Serodiagnostic Methods. Translated by Ross C. Whitman. J. B. Lippincott Co., Philadelphia, 1913.
[12] Kolmer: Infection, Immunity and Specific Therapy. W. B. Saunders Co., 1915.

SYPHILIS IN INTERNAL MEDICINE.

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In order to emphasize its frequency, it may be well to call attention to some of the statistics in regard to the prevalence of syphilis in general. Whitney,[1] in San Francisco, found 6.9% of the patients attending the out-patient clinics of one hospital infected in a series of 7885 patients. Symmers,[2] in New York City, found syphilis in 6.5% of autopsies in a series of 4880 done at Bellevue. Of Whitney's cases, 21.8% were found in the medical clinic and 22.6% in the nerve clinic, so that nearly a half of the cases were affected with internal syphilis. I shall consider in this paper very briefly the facts concerning syphilis of the cardiovascular and renal systems, the respiratory system, and the digestive system.

HEART AND BLOOD VESSELS.

Symmers found aortitis in 56% of autopsies on syphilitics, or more than in any other organ of the body and a quarter of these showed involvement of the coronary arteries. Lenz[3] states that 25% of syphilitic patients in large cities die of aortitis or myocarditis or their results as against three or four per cent. from general paresis. Brooks[4] states that 60% of his luetic cases die from or with serious circulatory diseases, apparently of syphilitic origin. On the other hand, Herz,[5] in 2000 cardiovascular cases in his private practice, where Wassermanns are not possible in many cases and where direct questions in regard to syphilitic infection were not made frequently for social reasons, found 15% showed probable syphilitic etiology.

In regard to the pathology, the lesions in the heart may be pericardial, myocardial, or endocardial, always starting around the arterioles. Pericardial syphilis is usually fibrous, involving, in some cases, small patches and sometimes the whole sac. This may show scars later resembling the ordinary white patches and sometimes leaves an adherent pericardium. Pericarditis not infrequently is noted clinically in early syphilis, though usually it is not important. In the heart muscle Warthin[6] has shown that spirochetes can be demonstrated, causing every variety of parenchymatous change and, also, which is more frequent in the late-acquired syphilis, interstitial changes, always starting about the coronary arterioles, either as an arteritis or a periarteritis and going on to a fibrosis. There may be true gummata of the heart wall, but these are rare. In endocardial inflammation due to syphilis the left ventricle and septum are more commonly involved than the valve cusps and, of the valves, the aortic is the one usually involved. Signs of mitral leak are more often due in these cases to a muscular insufficiency. In the large blood vessels, as the aorta, the disease begins around the terminations of the vasa vasorum and causes a mesarteritis and periarteritis with breaking up of the elastic tissue of the media and consequent weakening of the wall, which makes a starting-place for a dilatation. In the small vessels endarteritis and periarteritis are the lesions found, the former leading to sclerosis and obliteration of the vessels. The arteries most commonly involved are the cerebral, coronary and the aorta. The latter is usually affected in its ascending part, preferably about the sinuses of Valsalva, which means probable involvement of the aortic cusps and mouths of the coronaries secondarily. Grossly, the artery wall shows gelatinous, translucent-looking areas over the places where the intima is destroyed. Later lesions show wrinkling and puckering of the intima over the fibrous media, often in radiating lines. The cerebral arteries, and especially the circle of Willis, are very frequent seats of the periarterial changes, which cause miliary aneurysms.

The time of onset of the arterial and cardiac lesions may be very early. Brooks[7] has notes of 24 cases in the secondary period, one before the appearance of the secondary rash. Three of these were fatal. Fordyce,[8] also, has collected several fatal cases in this period and he is of the opinion that, in the secondary period, when the body is overrun with spirochetes, some are lodged here and form the nidus for lesions which usually do not appear, clinically, until years later, usually from 47 to 49 years of age. Stadler and others give the average as twenty years after infection.

In regard to symptoms, in the early cases, irregularity of no definite type, and rapidity of action on slight exertion or apprehension, are often seen in secondary syphilis. Pain and tenderness on deep pressure over the pericardium are common. Irregularity of force and rhythm of the pulse, but no rise of blood pressure, unless renal or other complications ensue, are frequent. All these lesions are seen in other acute infectious diseases without organic changes in the cardiovascular system, but from a few of them that have come to autopsy Brooks and Fordyce are of the opinion that these slight signs may be the outward signs of beginning trouble. Systolic murmurs, also, are common at this period, 40% of secondary cases, according to Grossman.[9] Some of these cases may become serious, as before stated, and the following is an example:—

Male, age 30. P. H. Attacks of acute rheumatism for past nine years, frequently following tonsillitis, but up to beginning of present illness never any cardiac signs or symptoms. Present illness. Two months ago sore throat and general malaise with severe pains in joints generally. One week later, typical intense syphilitic rash appeared with severe headaches and general glandular enlargement. Induration found along urethra about ¾ inch from meatus. Wassermann strongly positive. Two weeks ago, day following third injection of salvarsan and after patient had received four doses of mercury salicylate intramuscularly, patient had chills, cough and pain in chest. Condition grew worse and on admission had to-and-fro murmur all over precordia. Two days later precordial sound had disappeared and there were signs of fluid in the pericardium. Patient was dangerously ill with septic temperature, gallop rhythm, and pulse 140 to 150. Under treatment with mercury, however, the friction sounds reappeared and the signs of fluid gradually disappeared and in two months he was discharged showing nothing abnormal in the heart on physical examination. It is fair to say that the patient received the best of hygienic and medical care with the usual cardiac remedies, but I think that Dr. T. F. Leen, under whose care he was for the cardiac trouble, agrees that, without the aid of antisyphilitic remedies, the patient would have died.

Later in the disease, in the so-called tertiary period, substernal pressure and pain are the most frequent initial symptoms of trouble in the aorta or heart. But frequently the disease of the coronaries causes sudden blocking of the vessel, or an acute dilatation, or rupture of a previously weak myocardium occurs and sudden death ensues with practically no premonitory symptoms. If the cerebral arteries are affected, there may be sudden vertigo or confused mental state, or loss of function of speech, or a weakness of the arm or hand or one foot due to changes in the circulation. If this has been the cause, rather than a complete rupture of the vessel, the circulation is often restored with complete restoration of function. Such a case is the following:—

Male, age 29. Infection 10 years ago. Treated six weeks. Tertiary lesion of throat one year ago. At that time started treatment again and took four full doses of salvarsan and courses of mercury salicylate until March, after which he neglected treatment again. Sept. 16th, while at work as a club steward, sudden motor aphasia with weakness of right hand grasp. Under inunctions of mercury and iodide of potash prescribed by his family doctor, Dr. W. A. Griffin, who had previously referred the case to me, he recovered absolutely and was back to work in two weeks.

The following is a case where there was a rupture of the artery:—

Male, age 25. Seen at the City Hospital out-patient department last May. Patient was an old case, having had a short course of treatment a couple of years before when he had a secondary rash. Came to the out-patient department on account of headaches, which appeared to be syphilitic from the story. He was given a prescription for inunctions of mercury. On his way home he stopped at the L St. Bath House and while there dropped dead. At autopsy by the medical examiner, Dr. Leary, a haemorrhage, filling the ventricles and covering a large part of one side of the cortex, was found arising from a ruptured miliary aneurysm at the base of the brain, about 2 mm. in diameter.

The circle of Willis is such a complete anastomosis that if these arteries are slowly shut off there may be no symptoms or only transitory disturbance of function, as is shown post mortem where the basilar artery may be completely occluded without any history of disturbance during life. A sudden blocking of any of these arteries, on the other hand, is necessarily always fatal. Another thing to be remembered in these cerebral cases is the fact that the lesions may be multiple and, after the patient has had one attack, he may be liable to have another under sudden mental strain. In the cardiac and the aortic cases, as the lesions progress, the symptoms develop according to the particular part affected, and they differ in no way from the same lesions—myocarditis, angina pectoris, aortitis, with involvement of the aortic valves and consequent regurgitations, or aneurysm of the heart or aorta—due to other etiological factors than syphilis. Certain lesions, however, are more common in syphilis than as a result of other infectious diseases. Aneurysm of the arch of the aorta is almost invariably due to syphilis. Fordyce recalls but one instance where he could ascribe it to other causes. Other authors vary on this point, some claiming that around 80% are due to syphilis, while others maintain that an aneurysm of the arch is *prima facie* evidence of syphilis. In my own experience, I have not met with a definite aneurysm of the aortic arch, with a negative Wassermann reaction. A roughening of the aorta with practically no enlargement of the heart and very little, if any, general arteriosclerosis, is usually of syphilitic origin. Heart block is nearly always due to syphilitic interstitial or gummatous disease of the Bundle of His. Brooks found that 70% of his cases of heart syphilis coming to autopsy showed valvular lesions, mostly of the aortic valve, but fairly often the mitral was also involved. He did not see any case where the mitral was involved without the aortic, however. The symptoms which all writers connect particularly with syphilis are tachycardia and irregularity of the heart, the latter being just "irregularly irregular," as Brooks describes it, without any type whatever. Pain under the sternum and substernal tenderness after slight exertion are also particularly common and usually denote coronary disease or myocardial dilatation. With the x-ray we generally find a broadened aortic arch, and sometimes one part of it is slightly more dilated than the rest. The heart shadow is also said to be broadened in many cases. In aneurysm of the arch due to syphilis, the heart shadow is also lengthened and Friedländer[10] considers a characteristic point, that the aneurysm of syphilis pulsates more markedly and the shadow is not so intense as in that due to ordinary sclerosis not due to syphilis; but I should imagine that this comparative difference would be hard to make out, and not of much practical value. The Wassermann reaction is practically always strongly positive in an aggressive case of cardiac syphilis, but some of the older ones, which are not showing anything more than a murmur, with compensation complete, may give a negative.

The venous system, also, is occasionally involved in acquired syphilis, but only rarely. Fordyce notes syphilitic thrombosis of the veins of the lower extremities. Friedländer mentions that nodular and general inflammatory changes of the venous walls, which appear to leave the lumen partly occluded by consequent puckering, may occur in any veins of the body, but the portal veins and their branches are the ones chiefly affected. The lumen of the vein is puckered, and around the vein is a gray, moist, translucent appearance fading gradually into the liver tissue.

DIAGNOSIS.

In early syphilis if care is taken to listen to the heart and note the pulse frequently, the appearance of a soft mitral systolic with irregular heart action and, perhaps, some tachycardia and substernal oppression after exercise, probably do not always mean cardiac syphilis, but they may be warnings enough to make us spare the heart in that patient by hygienic measures. Brooks has shown us, too, that these may mean real cardiovascular disease is present. In later syphilis, the problem is more difficult, from the fact that only about 30% of cardiac cases give a history of previous syphilis in hospital cases and probably less in private practice. Often the patient, thinking that the cardiac symptoms are so long delayed after the primary lesion, never imagines the connection and, unless directly questioned about syphilis, will fail to mention that he ever had it; but more frequently, in my experience, the patient is absolutely ignorant of ever having had any such trouble. As I have already shown, the cardiac lesion is only what we might find due to any other cause, except that aneurysm of the aortic arch and heart block are almost always syphilitic. The age of the patient, usually between 40 and 50, frequently younger, is a little under that of the ordinary arteriosclerotic. The history may reveal another acute infectious disease, such as acute rheumatism or scarlatina or typhoid as an etiological factor. Brooks and others say that a cardiac or aortic lesion, developing without other known cause and without fever, and especially if combined with a positive Wassermann reaction, in a middle-aged person is probably syphilitic. In those cases where the Wassermann reaction is negative, a provocative injection of mercury salicylate or of salvarsan may develop a positive reaction. If still in doubt, and the patient is not doing well under ordinary cardiac treatment, no harm can be done by giving him the benefit of the therapeutic test, and this is the most surely to be relied upon of all. Care must be exercised in the interpretation of the Wassermann reaction in these cases, for this only means that the patient has syphilis and not that the particular lesion in the heart is necessarily syphilitic. This brings up another very important point in the diagnosis, namely: other signs of past or present syphilis in the patient, such as tibial nodes, obscure bone or joint lesions, enlarged liver, etc. Several authors have called attention to the frequency of combined cardiac and nervous syphilis, especially tabes. Lesser[11] in 91 autopsies on tabetics found aortic aneurysm 18 times. Others place the frequency of combined cardiovascular syphilis and tabes as about 6 to 10% of tabetics. The cardiac lesion may be present before the onset of the tabes, but it is usually noted about four and a half to five years after the first tabetic symptom.

TREATMENT.

All writers at present call attention to the necessity of protecting the heart in early syphilis from sudden or severe strain, as one would do in any other acute infectious disease, in order to avoid later heart complications. Fortunately, the treatment of the earlier lesions is, usually, pretty thoroughly carried out, for then there are other and very obvious symptoms of syphilis which make the patient follow up the physician's instructions. But too much stress cannot be laid on the fact that the treatment of syphilis which is given must be intensive and prolonged. In these early cases, outside of hygienic measures such as rest, cardiac medicaments such as digitalis, etc., are not needed and are better not employed.

In the later cases, one often meets with a patient in whom a thorough course of ordinary cardiac treatment, with rest in bed and digitalis and other cardiac remedies, has failed to establish compensation and the condition is pretty discouraging. It is just in such cases as this that we often see the most satisfactory improvement follow a course of intensive anti-syphilitic treatment. If there is no immediate urgency, it is safer to commence with mercury, preferably injections of the insoluble salicylate of mercury, which is given once every five days or a week into the muscle. Inunctions do better in some cases, using the strong 50% ointment or one of its less disagreeable substitutes. In a week or two we may start with the salvarsan, which is more permanent in its beneficial effects and seems to cause no more serious collapse in these cardiac cases than the neosalvarsan, though the immediate effects of the latter may be just as striking in the way of relieving symptoms. Salvarsan should be used with great caution in these cardiac cases, beginning with a very small dose and increasing only after the effects are well borne. Most especially in cardiac cases with disease of the myocardium and irregular heart action must one use great caution with the first dose of salvarsan. Brooks reports two cases of nearly fatal collapse following the initial dose of salvarsan and I have seen one in consultation with Dr. A. D. MacLennan where salvarsan, given at my suggestion, was followed by a fatal result in a little over twenty-four hours, in a case of heart block. It is fair to state, however, that in my case the patient was nearly *in extremis* when the salvarsan was given and it was administered only in the forlorn hope that something might be done for the patient and it was evident that it must be done quickly if the life of the patient could be saved at all. In another such case I would suggest salvarsan but in a dose of only 0.1 or 0.15 g. In cardiovascular cases it seems to be better to give the doses of salvarsan far apart, continuing the mercury in the meantime. There seems to be no doubt that mercury alone will cure many cases of cardiac syphilis, but the addition of salvarsan surely does it with more speed and relieves the symptoms more quickly. It is also true that salvarsan alone will cure many of the earlier cases and possibly a few of the later ones, but it is too early to know of the permanency of these cures and, in the few where salvarsan has been used alone, its effects do not appear to be nearly so lasting as when it is backed up with an intensive course of mercury. If the case does not seem to improve under one form of mercury, it sometimes is advantageous to change to another. Anders[12] and Brooks both mention cases that after a while seemed to do pretty well on mercury by mouth, though these are rather the exception. As regards the duration of treatment with mercury and salvarsan, it is hard to lay down any rules. One should try, if possible, to get a negative Wassermann reaction and continue the mercury at least one year after this is obtained. But a negative reaction is sometimes not obtained at all, and if, after a couple of years, the reaction is not altered from the original strong positive, it may be better to give up and merely give an annual or a semi-annual course of mercury to make sure that the disease does not return, provided that the limit of improvement seems to have been already obtained clinically. Often the patient seems to have become immune to the effects of mercury and it is, therefore, better to give it to the limit of tolerance and then stop for a while before giving any more.

The ordinary treatment with usual cardiac remedies should be in no way neglected, although they often do not seem to accomplish such definite results in these as in ordinary cardiac cases from other causes. In regard to iodides, the present idea is that they do not act in a specific sense, but merely absorb the products of inflammation and exudation after the cause has been removed by mercury and arsenic. From this point of view it is advised not to use them at first, but only after considerable treatment with mercury and arsenic. They do not need to be pushed very high, five to fifteen grains t. i. d. doing apparently as well as the larger doses. When once commenced they should be continued until their maximum effect is obtained, if any improvement is noticed, otherwise for a few months.

Now in regard to the prognosis in these cases. Under ordinary treatment the duration of life is usually about two years after the onset of symptoms. On the other hand, unless too far advanced, one can almost surely promise a prolongation of life by the specific treatment. In the secondary cases, with very rare exceptions, one can promise a cure in practically every case, regardless of the apparent hopelessness in some cases. In tertiary cases the inability to repair the heart muscle and the artery walls makes a cure impossible where much serious damage has been done. Post mortem, in a well treated case, one finds a fibrosis of the heart muscle, or an occluded coronary artery surrounded by fibrosis, or, if there has been a true aneurysm, this persists; and the same is true regarding serious damage to the valves, but, under the microscope, no active foci which can be diagnosed as syphilis and no spirochetae pallidae are found. Clinically the results compare very favorably with treated gummata of the bones and other places and one can never tell how much irretrievable damage has been done until a thorough course of treatment, both with anti-syphilitic and ordinary cardiac remedies, has been tried. Good effects are often astonishing. Cases, however, where through neglecting treatment the symptoms have relapsed, do not as a rule respond so readily a second time. Where combined anti-syphilitic and cardiac remedies fail, the downward course is usually pretty rapid.

SYPHILIS OF THE KIDNEYS.

Albuminuria in early syphilis is by no means rare, but a true nephritis is very uncommon. Stokes,[1] in the last year, has described a typical case of the latter. Early syphilitic nephritis comes on about the fifth month of the disease on the average, though it has been reported before the appearance of the secondary rash. The condition starts in rather suddenly and is distinguished by the very large amount of albumin, with marked anemia and oedema. But outside of some general weakness there is comparatively little disturbance of the general health. There is often rather rapid loss of weight. Fournier states that the cases go on, in about 30%, to uremia, but other authors do not find this so frequent. Most writers say that they generally get well under treatment, though Bradford has noted frequent relapses with albuminuria. The urine in these cases is slightly diminished and shows a very large amount of albumin, many hyaline and granular casts, occasional epithelial casts, occasional red blood corpuscles and leucocytes. Stengel[14] and Austin have made a careful study of the double refractive bodies described by Munk in syphilitic nephritis and find that they are pretty constant in the parenchymatous, but rarely occur in the interstitial forms. As this early nephritis is of the former variety, the findings of these bodies are noted, but as they also are found in a fair percentage of nephritis due to other causes, their significance would hardly be considered as great. Spirochetae pallidae have been noted in the urine of one of these cases, but this was not from a catheterized specimen. In later syphilis, Squier,[15] in 186 autopsies on syphilitics, found 125 with renal lesions, amyloid 36, and gummata 6. Chronic interstitial and chronic parenchymatous nephritis, chiefly the former, are also found. Pathologically, in syphilitic nephritis, the chief characteristic is marked endarteritis with thickening of the connective tissue of the kidney and capsule (Fordyce). Spirochetae pallidae have not been demonstrated in the kidney. The diagnosis rests on the presence of a nephritis with a history of syphilis or a positive Wassermann reaction and the presence of syphilis elsewhere. There are very few cases, however, in which we can make a positive diagnosis of syphilitic nephritis without recourse to the therapeutic test. Barach[16] reports several cases in which the albumin has disappeared, even in cases where it has existed for three years or longer before treatment. I have seen two such cases where the albumin has disappeared under the use of salvarsan. In my opinion, some of those which do not react to anti-syphilitic treatment are really due to syphilis, directly or indirectly, but there is no way of proving this. The treatment is by salvarsan given cautiously and in small doses, followed by mercury and the iodides. The physiological dose of mercury and salvarsan must be learned by trial on the particular case, as Stokes has shown that the proper amount can easily be overstepped and an increase of the albuminuria and suppression of the urine, with a return of the edema, are produced.

SYPHILIS OF THE RESPIRATORY SYSTEM.

Mucous patches of the trachea are seen and a bronchitis, occurring in early syphilis and responding quickly to anti-syphilitic treatment, is probably a similar process in the bronchi; but secondary lesions of the lung are unknown. Tertiary lesions of the trachea and bronchi (gummata of the submucous tissue) are not uncommon and may lead to ulceration or cicatricial stenosis. Tertiary syphilis of the lung is very rare, according to the pathologist, but not so uncommon, according to the clinician. Clayton[17] has analyzed the cases and says that they can be grouped into three classes:— 1. gummata, which may occur anywhere but are most frequently situated near the root of the lung, and especially of the right lung and in the middle lobe. Some authors claim that these may break down in the center and discharge into the bronchi leaving cavities, but surely the more common change is into fibrous tissue with broad bands extending out into the lung. 2. A so-called syphilitic pneumonia which consists of an infiltration that may extend over the entire lobe and in which the blood vessels are much thickened. 3. What is, apparently, a later process of the preceding, fibroid induration, which consists of a proliferation of connective tissue starting around the root and extending around the bronchi and blood vessels, or occurring as nodules of fibrous tissue in other parts of the lung until the whole lung may be involved. Clayton does not believe that a case of true syphilitic phthisis, meaning a progressive destructive disease with cavity formation, has been proved. Bronchiectatic cavities are fairly frequent in syphilis of the lung and this fact aids a little in the diagnosis when they are found by the x-ray. Symptomatically, there is little difference between this condition and tuberculosis of the lung. The fever is not so common and the haemoptysis is rather rare, though several cases are reported. Levin reports one where this was the first symptom. The emaciation is usually not so marked. The duration for several years with a rather extensive process in the lung, especially if it is around the root of the lung, yet the patient does not show marked emaciation or poor nourishment, is a rather characteristic picture, and especially so when combined with an absence of T. B. in the sputum on repeated examinations, and with a positive Wassermann and other signs of syphilis elsewhere. The treatment is that of syphilis anywhere, but, according to the cases reported, if the lesion has existed for a very long time, results of treatment are unsatisfactory.

SYPHILIS OF THE GASTRO-INTESTINAL SYSTEM.

Symmers, in nearly 5000 autopsies, in which there were 314 cases showing signs of syphilis, found only seven cases of gastro-intestinal syphilis, of which only one was a lesion of the stomach, and he considers gastric syphilis as very rare. Smithies, in 7545 cases of gastro-intestinal affections, found 25 cases, or 0.34%, of gastric syphilis. Pathologically, syphilis of the stomach begins, according to Smithies, as a dense round-cell infiltration of the loose areolar tissue of the wall, frequently with endarteritis. This progresses by infiltrating the wall of the organ generally and causing a stiff, thickened wall, or it forms single or multiple gummata, which may ulcerate, or may form a large tumor which, if it goes on to cicatrization, may give an abnormal shape to the stomach or may cause a stenosis. Clinically, the patient may show only symptoms of chronic gastritis, but often there is a history resembling chronic ulcer of the stomach. Haematemesis is not an infrequent symptom in these cases and, in one case reported by Clark,[19] it was the only symptom in a fatal case. Other cases resemble carcinoma of the stomach very closely. Smithies found the hydrochloric acid in these cases not diminished, but most authors consider achylia the rule. A palpable tumor frequently is felt. A rather curious fact in some of these cases is the persistence of a good appetite and less anemia and cachexia than one would expect from such an extensive process if it were due to carcinoma. Usually the loss of weight is only about twenty pounds, on an average, which is less than we would expect in advanced cancer of the stomach. X-ray shows only a tumor or ulcer or stenosis, which is not characteristic of syphilis. Usually the Wassermann reaction is strongly positive and Smithies considers that this is the only way that we can be sure of a diagnosis, but Einhorn and Eiselman[20] report cases with a negative reaction. Three cases which I have seen had positive reactions and were clinically indistinguishable from cancer, so that the blood test was the only symptom which led to anti-syphilitic treatment, the effects of which were remarkably satisfactory in all three. The treatment is that of late syphilis anywhere, as these cases are almost always tertiary. In Smithies' 26 cases, the results generally were pretty satisfactory, though recurrences must be guarded against in giving a prognosis. Only four of his cases remain cured over a period of three years and three of the cases show no improvement whatever. In these latter cases it would seem as if there were some surgical condition present such as stenosis, or there may have been mistaken diagnosis. Hayem and Niles both report cases which were cured very quickly by anti-syphilitic treatment.

Syphilis of the intestines is rare, with nothing to characterize it as syphilitic. Symmers found one ulcer of the cecum in his series of autopsies and four cases of syphilitic stenosis of the rectum. The latter is more common in women. Another interesting lesion noted by Fordyce[21] is a periproctitis involving the surrounding tissue to such an extent that it resembled a tumor of the adjacent fascia.

SYPHILIS OF THE LIVER.

This is fairly frequent, occurring 142 times in 5088 autopsies done by Fordyce. Symmers in 314 autopsies on syphilitics found the liver involved in 105 cases (33.4%). Nearly one half of these cases were the so-called hepar-lobatum which appears to be more common in negroes and in women. In this condition the liver is separated grossly into numerous small lobules by scars and bands formed of fibrous tissue caused by syphilitic inflammatory changes resulting in an over-production of connective tissue. The spleen often is enlarged, also, in these cases. Clinically they are, practically, indistinguishable from cirrhosis due to alcohol. Gumma of the liver also is a fairly frequent result of syphilis. Usually they are multiple and the most common site is under the capsule on the anterior surface, where they are easily palpable. Amyloid resulting from syphilis gives a large, smooth liver clinically and, in the presence of other lesions elsewhere, is fairly frequently recognized during life. Perihepatitis, with fibrous adhesions to all the neighboring organs, is still another variety of the results of late syphilis. This may go on, as in one of my own cases, to adhesions throughout the abdomen which are most intractable to any form of treatment. In early syphilis we have a lesion which has attracted considerable attention in the last few years, namely, a parenchymatous hepatitis, similar to the parenchymatous changes in the kidney in early syphilis. Michael[22] has shown that they are true syphilitic changes and not due to pressure on the gall ducts, as was formerly maintained. This process may be very acute and go on rapidly to acute yellow atrophy and death, as in one of our cases at the Carney Hospital, or it may clear up with the formation of connective tissue and resulting cirrhosis. Clinically, the liver is enlarged and somewhat tender, but in the very acute cases the size is diminished. The jaundice is intense, the stools may or may not be clay colored, usually not, and the gastro-intestinal symptoms are usually mild, consisting of nausea and occasional vomiting, resulting probably from the icterus.

A good many cases have been reported in the last few years during or following treatment with salvarsan and neosalvarsan. At first these were supposed to be due to the toxic effects of the arsenic, but Milian[23] has shown pretty conclusively that they really are always syphilitic, corresponding to a Herxheimer reaction or to the nerve recurrences which were so much discussed a few years ago. They all improve with more mercury and salvarsan.

SYPHILIS OF THE SPLEEN.

During the secondary stage the spleen is very frequently enlarged, often accompanied by asthenia and fever. Later we find changes similar to those in the liver, namely: interstitial splenitis, at first with an enlarged spleen and, later, as the contraction of the connective tissue goes on, a small spleen; amyloid spleen; also multiple gummata. Perisplenitis is rather more common than perihepatitis, though the two often are combined. Clark[24] has described a case, with splenomegaly and asthenia and anemia, which resembled a case of early Banti's disease, but which quickly cleared up under anti-syphilitic treatment.

SYPHILIS OF THE PANCREAS.

Warthin, after finding marked interstitial changes in the pancreas in seven autopsies on cases of diabetes in whom there were, also, syphilitic changes in the myocardium, made a further study of the pancreas in a large number of autopsies in cases of apparently latent syphilis and found no one of them showing a normal pancreas. All showed marked changes in the form of a diffuse or patchy fibrosis with active inflammatory foci, corresponding to the localization of the spirochetae. This shows the necessity of investigating cases of diabetes thoroughly with reference to syphilis as a possible etiological factor. I have seen one case where the glycosuria cleared up quickly under anti-syphilitic treatment and several of these have been reported.

SYPHILITIC FEVER.

A few words about syphilitic fever do not seem to be out of place in a review of internal syphilis. A low grade of fever in early syphilis, generally at the outbreak of the rash or a little before it, is not uncommon. Fournier states that it occurs in about 20% of cases. The type may resemble that of rheumatic fever, especially when it is accompanied by pains in the bones and joints. Occasionally it simulates typhoid. This lasts only three or four days, and seldom goes above 100° F. Later, in the secondary stage, usually in combination with other complications, a more prolonged fever occasionally is observed which goes higher and lasts for some time. In tertiary syphilis there may be prolonged fever or short attacks of fever. These are especially noticed in syphilis of the liver. Febrile attacks in general paresis, from no apparent cause, are quite frequent. Kraus[25] maintains that these late fevers are due to the entrance of spirochetae into the blood stream. Taussig[26] claims that they are due to the entrance into the blood stream of endotoxins and dead bacteria, analogous to the fevers seen after a dose of salvarsan.

REFERENCES.

[1] Whitney, J. L.: Jour. A. M. A., Vol. lxv, pp. 1986-1989.
[2] Symmers, D.: Jour. A. M. A., Vol. [illegible], pp. [illegible]-1462.
[3] Quoted by Fordyce, J. A.: Harvey Lecture, 1914-1915, Vol. x, pp. 221-249.
[4] Brooks, H.: Am. Jour. Med. Sc., Vol. cxlvi, p. [illegible].
[5] Herz, M.: Wiener klin. Woch., Vol. xxix, pp. [illegible].
[6] Warthin, A. S.: Am. Jour. Med. Sc., Vol. cxlvi, pp. [illegible].
[7] Brooks, H., and Carroll, J.: Jour. A. M. A., Vol. lxiii, pp. 1956-1961.
[8] Fordyce, J. A.: Harvey Lecture, 1914-15, Vol. x, pp. 221-249.
[9] Quoted by Anders, J. M.: New York Med. Jour., Vol. ciii, 865-867.
[10] Friedländer, C.: Berlin. klin. Woch., Vol. lii, 1164-1168.
[11] Quoted by Fordyce, *loc. cit.*
[12] Anders, J. M.: New York Med. Jour., Vol. ciii, pp. 865-867.
[13] Stokes, J. H.: Jour. A. M. A., Vol. lxvi, pp. 1191-1194.
[14] Stengel, A., and Austin, J. H.: Am. Jour. Med. Sc., Vol. cxliv, pp. 12-17.
[15] Quoted by Stengel and Austin, *loc. cit.*
[16] Barach, J. H.: New York Med. Jour., Vol. cii, pp. 1139-1141.
[17] Clayton, T. A.: Am. Jour. Med. Sc., Vol. cxxix, pp. 563-575.
[18] Smithies, F.: Jour. A. M. A., Vol. lxv, pp. 572-576.
[19] Clark, O.: Brazil-Medico, Rio de Janeiro, Vol. xxx, No. 15.
[20] Einhorn and Eiselman: Discussion of paper by Smithies, *loc. cit.*
[21] Fordyce, J. A.: Jour. Cutaneous Diseases, 1915, Vol. xxxiii, p. 802.
[22] Michael, M.: Archiv f. Derm. u. Syph.: Vol. cxx, 3te Heft. orig., pp. 694-718.
[23] Milian, M. G.: Bull. de la Soc. Française de Derm. et Syph., Vol. xxv, p. 365.
[24] Clark, O.: Brazil-Medico, Rio de Janeiro, Vol. xxx, No. 1.
[25] Kraus, quoted by Fordyce, Jour. Cut. Dis., *loc. cit.*
[26] Taussig, F. T.: Jour. A. M. A., Vol. lxvi, p. 1818 (abstract).

A COMPARISON OF SEVERAL METHODS OF SPECIFIC EARLY TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS.

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Of the cases of acute anterior poliomyelitis that came to the Haynes Memorial Hospital during the recent epidemic, 120 are included in this comparative study. They are divided into six groups: Group I was treated with three intraspinous injections of immune serum; Group II was treated similarly with normal serum; cases of Group III were injected with their own spinal fluids (autotherapy—Duncan); Group IV comprised cases on which the effect of simple withdrawal of spinal fluid was tested; Group V received no specific treatment; Group VI includes cases of which one was of doubtful diagnosis, one died of pneumonia, and the others were moribund on admission.

1. The use of *immune serum* followed the discovery by Flexner and Lewis[1] that experimental poliomyelitis in monkeys produced immunity against reinfection. This resistance was found by Römer and Joseph[2] to be due to immune substances in the monkey's blood.

This immune body has the power of neutralizing the virus of poliomyelitis *in vitro*. It was furthermore found[3] that serum from recovered human cases possessed curative or, at least, prophylactic properties if injected into monkeys within twenty-four hours after they had received an injection of virus. The treated animals did not develop the disease, whereas the control animals did.

The first application of this experimental knowledge in the treatment of human cases was made by Netter,[4] who treated thirty-two cases by intraspinous injection of the immune serum.

He gave usually eight successive daily injections and obtained his serum from cases who had recovered from the acute stage three weeks to many years previously. He feels that the serum is decidedly beneficial, especially if treatment is begun before the fourth day of the paralysis.

Sophian[5] treated four cases and was favorably impressed with the results obtained. Wells[6] reports 15 cases, some of which received the serum intraspinously, others intravenously, and still others intramuscularly. He gives his results as either death or "recovery," and feels that the serum has been beneficial, especially when given intravenously in large doses and followed by withdrawal of spinal fluid. Four deaths out of the fifteen cases, a percentage of 26.7, is hardly to be considered encouraging. At any rate, the number of cases is too small and is not controlled by untreated cases, so that no unassailable conclusions are possible.

Zingher[7] feels that immune serum is useful, particularly when given in the preparalytic stage. He is not so sure, however, of the results obtained if the serum is applied after the development of paralysis, stating that "it is difficult to forecast. . . what the natural result of the disease would have been in these cases."

Amoss and Chesney[8] report 26 cases in considerable detail. Twelve of them received immune serum after paralysis had developed, and fourteen were injected during the preparalytic stage. Of the twelve paralytic cases, one died ten hours after the serum injection, two showed extension of paralysis, and in the remainder the paralysis receded. The authors do not seem to be very enthusiastic over these results. Needless to say, a parallel series with similar results could easily be drawn up from untreated cases. The preparalytic cases will be discussed later.

LeBoutillier[9] believes that immune serum therapy is productive of some good "if used on the first or second day of the acute paralytic stage in doses ranging from 5 to 15, or even 30 cc., either intraspinally, intravenously, or intramuscularly." The number of cases treated by him, and other information essential for a correct estimate of the value of his conclusions, are not given.

Roby[10] gave intramuscular injections of convalescents' whole blood to one case and of normal blood to two cases. He frankly says that no conclusions can be drawn from so few cases.

2. *Normal serum*, either human or animal, is supposed to exert a beneficial effect by the excitation of a polynuclear leucocytosis in the spinal fluid. Sophian[5] used horse serum in ten cases. He compares the results with those obtained in four cases receiving immune serum, and concludes that horse serum is at least as efficient as immune serum. No untreated controls are cited by him, so that, in spite of his small number of cases, he may have determined that horse serum and immune serum are equally efficient, but he cannot be said to have proved the value of either. Place[11] reports having used horse serum, as well as salvarsanized and mercurialized sera at the Boston City Hospital, without apparent beneficial results. Le Boutillier,[9] too, considers normal serum useless.

Zingher,[7] on the other hand, recommends normal serum, although he considers it less valuable than immune serum.

3. The subcutaneous *reinjection of the patient's own spinal fluid* is recommended by Duncan,[12] and is based upon alleged good results obtained from the use of the method in the treatment of cerebrospinal meningitis.

4. Simple repeated *withdrawal of spinal fluid* to reduce pressure was advocated by Römer and also by Koplik. Wynkoop[13] states that it is of immediate benefit before the onset of paralysis if the spinal fluid pressure is increased, and Le Boutillier[9] claims that it will relieve pain in a large percentage of cases.

Aside from the methods used in this study, two others deserve mention, although I have no experience with them. One is the administration of hexamethylenamin or urotropin, recommended by Flexner[14] as being the "only drug which has shown any useful degree of activity." Fraser,[15] however, after treating 22 cases by giving 0.3 gm. urotropin 3-4 times daily, states that in "no instance did this treatment appear to cut short the acute stage, and in no instance was there evidence of more satisfactory or more rapid recovery in the paralyzed parts." This result is in accord with the fact that hexamethylenamin acts as a germicide in an acid medium only, as, for instance, the urine, whereas the spinal fluid and blood are alkaline in reaction. Lovett is quoted by Barber[16] as reporting three children of one family. "The first child received no hexamethylenamin, the second had a little, and the third had large doses from the beginning. The first child was severely paralyzed from the waist down, the second had weakness of the legs and back for a few months, and the third had no muscular involvement." Barber remarks that after "such an observation, its use early in suspected cases seems highly desirable," which again demonstrates the pernicious influence of drawing conclusions from too meager data. Le Boutillier[9] abandoned it as useless after trying it for two and a half months.

Another method of drug therapy is the administration of adrenalin or epinephrin, of which Meltzer[17] is the chief advocate. This preparation is given intraspinously to reduce the peri-inflammatory edema and active hyperemia. Lewis[18] reports 77 cases treated in this way with results that led him to recommend its use. To the reader of his article the cause of his optimism is not made clear. Hoyne and Cepelka[19] used epinephrin chlorid in several early cases and noticed immediate improvement in some of them. This, however, "was seldom permanent, but gradual improvement in some cases seemed to be more rapid." Place[11] reported using the drug without favorable results, and Le Boutillier[9] considers his own results questionable, because it seemed to him impossible to have the solution reach the upper part of the cord if the lesion was high. Nevertheless, he recommends its use until a better method is found, and feels that in combination and alternation with immune serum, it is beneficial. If the drug is of use, it probably finds its sphere of usefulness in the prevention of fleeting paralysis, especially of the respiratory centers, due to simple hyperemic pressure, rather than in exerting an influence upon paralysis caused by direct affection of nerve cells.

The appended tables, giving a few important facts about the cases at the Haynes Memorial, need practically no explanation. The results are tabulated under the headings: died, not improved, slightly, moderately, or markedly improved. *Table I* contains 20 cases treated with "immune" serum. The amount of serum injected varied from 2.5 to 15 cc. per dose. The donors were individuals who had recovered from the acute stage of the disease two weeks to five years previously.

Table II shows 16 cases who received normal serum intraspinously. The amount of serum injected varied from 0.5 to 13 cc. Polynucleosis, which is supposed to be the cause of any benefit derived from this procedure, was found in all cases after the serum injection, ranging from over 100 to between 4000 and 5000 per cmm. (Immune serum gave the same reaction.)

Table III comprises 20 cases treated with autotherapy. The spinal fluid was reinjected immediately after withdrawal. The site of the injection was the subcutaneous tissue over the seventh rib in the posterior axillary line. With the exception of an occasional larger dose (to 7 cc.) in some of the older patients and a few smaller doses (as low as 1 cc.), when the amount of fluid obtained was no larger, the dose was 5 cc.

Table IV contains 20 cases, each treated by three lumbar punctures at 24-hour intervals. The amount of fluid drawn per puncture varied from 0 to 30 cc.

Table V is made up of 28 cases, untreated except for general measures such as were accorded all others.

Table VI contains 14 cases, in one of which the diagnosis was doubtful, one died in three weeks of pneumonia, and the others died within 2 to 48 hours after admission.

The results recorded in these tables were nearly all observed at the end of six weeks, when most of the patients left the hospital. The immediate effects showed no apparent differences in the various series. A comparison of the results obtained shows, I think, that none of the measures used had any favorable influence whatever upon the progress or outcome of a single case.

Whether or not treatment instituted before the appearance of paralytic symptoms is useful, remains to be determined. Flexner and Lewis[3] were able to prevent the development of poliomyelitis in monkeys if they injected immune serum within 24 hours after the animals were infected. Since the incubation period averages eight days, it would seem that the time for effective serum treatment is long past when the first symptoms make their appearance. Furthermore, the mere failure of paralysis to develop after serum treatment can certainly not be adduced to prove the efficacy of this procedure, because many so-called abortive cases never develop paralysis and recover without treatment. It would be necessary to show that untreated cases go on to paralysis in greater numbers than do treated ones.

Zingher[7] reports 54 preparalytic cases, treated with immune serum, of which only ten developed paralysis, whereas of twelve untreated cases, seven became paralytic. Opposed to this is a series of 24 preparalytic cases reported by Place,[11] sixteen of which were left untreated and eight got intraspinous "immune" serum. Three of the treated cases and only one of the untreated ones developed paralysis, showing that the serum treatment was certainly not capable of preventing this complication. Place stated that his series of cases was too small to serve as a basis for definite conclusions, and the same objection may be advanced against Zingher's twelve untreated cases. Zingher himself admits that it is not easy to state "how many of the patients treated with immune serum would have remained free from paralysis without serum treatment," and that the "results and the conclusions from any form of treatment in a disease which is so variable in symptomatology and in prognosis, both as to life and disability, must be given with reserve."

Of the fourteen cases treated in the preparalytic stage by Amoss and Chesney,[8] two developed respiratory paralysis and died, two acquired partial paralysis of certain muscle groups, and ten recovered without paralysis. No controls are cited, so that the series is of little value, particularly in view of the better results observed by Place in his series of untreated preparalytics.

In conclusion, I would say that not only must the various measures employed in this study be looked upon as useless, at least after the onset of paralysis and under the conditions under which the investigation was carried out, but the manipulation of the sufferers necessarily attendant upon lumbar puncture causes great pain, and would seem to be permanently harmful in view of the great need of rest during the early stage of the disease.

TABLE I. TWENTY CASES TREATED WITH "IMMUNE" SERUM.

Tabular Number	Serial Number	Name	Age	Paralysis	Amount Injected (cc.) 1	2	3	Improvement
1	11	E. W.	5	Both legs, bladder	9.0	0.0	0.0	Marked
2	13	W. D.	4	Left face, left arm	8.0	10.0	9.0	Marked
3	15	R. G.	2½	Both legs partial	6.5	5.0	5.0	Moderate
4	16	G. S. B.	12	Both legs, deglutition	6.5	10.0	9.0	Marked
5	20	C. F.	3	Both legs, (esp. left), left arm, bladder	9.0	5.0	3.5	Moderate
6	22	C. L.	10	Both arms	3.0	5.0	4.0	Slight
7	24	A. A.	16 mos.	Right leg, abdomen weak	4.0	5.0	5.0	Slight
8	25	P. C.	10 mos.	Both legs, both arms partial, thorax, larynx	5.0	5.0	5.0	Died (in 6 weeks)
9	31	J. C.	2	Both legs, esp. left	2.5	4.0	5.0	0
10	32	H. S. T.	3	Right leg partial	5.0	5.0	7.0	Moderate
11	34	E. M.	3	Both legs, right arm, all partial	5.0	5.0	8.0	Moderate
12	35	E. M.	5	Both legs partial	5.0	5.0	7.0	Moderate
13	38	I. C.	1½	Left leg partial, right face	5.5	6.0	4.5	Moderate
14	41	A. H.	2	Both arms and legs partial, post. trunk, larynx, bladder, rectum.	4.0	11.0	6.0	Marked
15	44	A. L. I.	3	Both legs, esp. right	8.0	7.0	7.0	Marked
16	46	J. M.	2	Both legs partial	7.0	6.0	7.0	Moderate
17	48	J. K.	3	Both legs partial, post. trunk, neck	6.0	8.0	6.5	Marked
18	50	M. B.	24	Both legs, esp. left	14.0	15.0	15.0	Moderate
19	51	M. M.	4	Left leg partial, post. trunk	5.0	6.5	0.0	Marked
20	75	R. H.	1½	Neck and back partial	5.0	5.0	6.0	Marked

TABLE II. SIXTEEN CASES RECEIVING NORMAL SERUM.

Tabular Number	Serial Number	Name	Age	Paralysis	Amount Injected (cc.) 1	2	3	Improvement
1	89	E. A.	7	Left face, larynx, neck	5.0	?	6.0	Died —6 days
2	90	H. C.	1½	Right arm partial, neck	3.0	8.0	6.5	Marked
3	92	M. G.	2	Left face	5.0	9.0	6.0	Moderate
4	95	A. T.	2½	Both legs, esp. left	5.0	6.5	8.0	Slight
5	96	E. L.	12	Post. trunk	9.0	6.0	0.5	Marked
6	97	A. D.	3	Both legs, trunk	8.0	7.0	0.0	Moderate
7	99	D. S.	3	Post. trunk, both legs, esp. right	8.0	5.0	8.0	Marked
8	100	M. E. S.	11	Both legs slight, left arm partial	10.0	0.0	0.0	Marked
9	104	J. L.	14	Both legs, esp. right	10.0	13.0	4.0	Marked
10	105	L. C.	2	Both legs, esp. right, right arm partial	6.0	6.0	4.0	Moderate
11	109	M. J.	1	Both legs, trunk	4.0	10.0	0.0	Slight
12	110	J. P.	2	Left leg	7.0	5.0	0.0	Slight
13	111	J. Q.	5	Both legs partial	5.0	8.5	10.0	Marked
14	117	W. B.	3	Right leg	6.0	5.0	6.0	Moderate
15	118	J. S.	2½	Both legs partial	6.0	5.5	4.0	Moderate
16	120	M. O.	1½	Neck, thorax, larynx, left arm	6.0	4.0	0.0	Moderate

TABLE III. TWENTY CASES RECEIVING SUBCUTANEOUS INJECTIONS OF SPINAL FLUID.

Tabular Number	Serial Number	Name	Age	Paralysis	Amount Injected (cc.) 1	2	3	Improvement
1	10	E. F.	4	Left leg complete, right partial	5.0	5.0	0.0	Moderate
2	12	J. M.	5	Right leg complete, left partial	6.0	5.0	5.0	Marked
3	18	S. S.	25	Right leg partial	6.5	5.0	6.5	Marked
4	19	C. T.	1½	Both legs, esp. left, left arm and thorax partial	5.0	5.0	5.0	Moderate
5	21	A. F.	4	Both legs partial	5.0	5.0	3.0	Slight
6	23	C. S.	4	Tongue, larynx, left face, deglutition	5.0	5.0	5.0	Moderate
7	26	A. Q.	2	Both legs partial, esp. left	5.0	5.0	5.0	Marked
8	27	E. I.	15	Both arms partial, esp. right, left leg	5.0	5.0	7.0	Moderate
9	29	E. P.	2	Right arm partial, left leg partial	5.0	5.0	4.5	Marked
10	30	A. R.	1	Both legs, left arm partial, thorax weak	4.0	5.0	5.0	Slight
11	33	L. C.	2½	Right arm slight weakness	3.0	1.5	2.5	Marked
12	36	W. M.	7	Mastication only	5.0	5.0	5.0	Marked
13	37	J. C.	3	Both legs, esp. right, bladder, both arms slight	5.0	5.0	1.25	Moderate
14	40	A. P.	2	Both legs	5.0	5.0	5.0	Slight
15	42	R. H.	2½	Left leg weak	5.0	1.0	1.0	Marked
16	43	W. M.	2	Left leg and left arm partial	5.0	4.0	6.5	Marked
17	47	F. R.	1½	Both legs, left arm, post. trunk, neck	5.0	5.0	0.0	Slight
18	49	F. D.	5	Left face	5.0	1.5	5.0	Slight
19	52	M. F.	5 mos.	Both legs, esp. left	5.0	5.0	1.5	Moderate
20	67	W. A.	10	Left leg	5.0	5.0	5.0	Moderate

Table IV. Twenty Cases Treated by Triple Lumbar Puncture.

Tabular Number	Serial Number	Name	Age	Paralysis	Amounts Drawn (cc.) 1	2	3	Improvement
1	55	F. F.	2	Both legs, esp. right	11.0	15.0	1.0	Slight
2	56	J. N.	8	Both legs, esp. right	14.0	15.0	12.5	Marked
3	57	J. C.	3	Both legs, esp. left, neck	13.0	4.0	3.0	Marked
4	59	V. D.	14 mos.	Both legs, partial	1.5	1.0	3.0	Moderate
5	60	E. F. R.	4	Both legs slight, esp. right	8.5	0.0	3.0	Marked
6	61	R. F.	3	Both legs, esp. left, left arm, larynx, thorax moderate	3.0	15.0	4.0	Slight
7	62	G. F. L.	2½	Both legs, esp. right	30.0	11.0	2.0	Moderate
8	63	E. Y.	2	Both legs, esp. right, right arm partial	7.0	4.0	2.0	Marked
9	64	H. B.	3	Both legs partial	15.0	35.0	8.0	Marked
10	65	C. B.	1½	Both legs, esp. left	?	13.0	3.0	Moderate
11	66	J. R.	2	Both legs partial	14.0	24.0	7.0	Moderate
12	68	P. S.	3½	Both arms partial	5.0	1.0	?	Marked
13	70	G. H.	5	Left face	5.0	2.0	9.0	Moderate
14	73	A. B. H.	1	Right leg	15.0	2.0	4.5	Moderate
15	74	M. A.	5	Both legs, esp. left, bladder slight, post. trunk moderate.	15.0	30.0	12.0	Moderate
16	76	C. D.	5	Right arm partial	12.0	5.5	1.0	Marked
17	77	T. F.	3½	Both legs, esp. right	?	?	?	Moderate
18	79	E. M.	2	Both legs, esp. left, right arm, right face	10.0	7.5		Died —4 days
19	83	E. P.	10	All four extremities, trunk, thorax	10.0	13.0	6.5	Died —8 days
20	88	B. B.	3	Both legs partial, post. trunk	17.0	11.0	0.5	Marked

Table V. Twenty-Eight Untreated Cases.

Tabular Number	Serial Number	Name	Age	Paralysis	Improvement
1	1	M. Y.	2	Right leg	Marked
2	2	L. H.	23	Both legs	Moderate
3	3	L. C.	15	Both legs, bladder and bowel	Moderate
4	6	F. V.	3	Partial, both legs	Marked
5	7	E. B.	1	Complete right arm, partial left arm	Slight
6	8	N. B.	8	Right arm complete, left arm partial	Moderate
7	9	G. A.	2	Both legs partial	Marked
8	14	C. M.	8	Both legs, esp. right	Marked
9	17	R. H.	18	Both legs, esp. right	Slight
10	45	M. D.	2	Right face	Slight
11	53	A. M.	1	Right arm almost complete, left, slight weakness	Slight
12	69	F. N. C.	14 mos.	Both legs, right arm partial	Moderate
13	81	E. B.	5	Both legs partial	Marked
14	82	J. H.	4	Left leg partial	Marked
15	84	M. F.	11	Neck, thorax, both arms, esp. left	Slight
16	85	A. J.	14 mos.	Both legs, esp. left, thorax, neck, larynx	Died
17	86	H. C.	7	Both legs, esp. right	Moderate
18	87	D. S. W.	6	Right face, both arms, esp. left, neck, thorax	Marked
19	94	E. G.	5½	Left leg	Moderate
20	102	E. F.	4	Left leg slight, post. trunk	Marked
21	106	S. M.	6	Right leg partial	Slight
22	108	W. J. R.	4	Both legs, both arms slight, post. trunk, neck	Slight
23	112	E. W.	1	Thorax, both arms, neck, larynx, left face slight	Moderate
24	113	I. M.	10	Both legs partial	Marked
25	114	H. E.	19	Both legs, esp. right, bladder	Slight
26	115	L. W.	6	Deglutition, diaphragm, right face slight	Marked
27	116	D. B.	9	Left face partial, anterior neck	Moderate
28	119	J. M.	25	Both legs, esp. left, bladder, thorax, both arms.	Moderate

TABLE VI. SIXTEEN CASES NOT INCLUDED IN OTHER TABLES.

Tabular Number	Serial Number	Name	Age	Paralysis	Remarks
1	4	G. W.	7	Both legs, larynx, both arms partial, whole trunk	Died on day of admission
2	5	M. F.	2¾	0 (Left peroneals said to have been affected 4 days before admission)	Doubtful diagnosis
3	28	M. M.	16	Both arms and legs, thorax	Died 3½ hours after admission
4	37	H. W.	7	Both legs, both arms, esp. left, larynx, thorax	Died within 24 hours after admission
5	54	R. J. B.	3	Both legs, both arms partial, larynx, neck, thorax, post. trunk	Died 6 hours after admission
6	58	F. M.	14 mos.	Both legs, esp. right.	Died in 3 weeks of pneumonia
7	71	H. E. S.	4	All extremities, thorax, larynx, sphincters	Died 2 hours after admission
8	72	H. G.	2½	Both legs. right arm, left arm partial, thorax	Died within 48 hours
9	78	G. H.	14 mos.	Both legs and left arm partial (Temp. 109°)	Died within 48 hours after admission
10	80	M. G.	25	Both arms, thorax, post. trunk and abdomen, speech	Died within 48 hours after admission
11	91	G. S.	1¾	Larynx, neck, thorax, palate	Died on day of admission
12	93	E. K.	26	Both legs, esp. left, both arms, whole trunk, voice	Died within 24 hours after admission
13	98	S. C.	5	Left face, thorax, larynx (convulsions, Temp. 106.2°)	Died within 24 hours after admission
14	101	W. C.	4	Both arms slight, larynx, neck, thorax	Died 3 hours after admission
15	103	D. S.	16 mos.	Right arm slight	Died in convulsions 24 hours after admission
16	107	J. S.	2	0 (Fever, vomiting, headache, convulsions—Another case in same family)	Died in convulsions within 48 hours after admission

TABLE VII. SUMMARY.

Group	Treatment	Number of Cases	Improvement				
			Marked	Moderate	Slight	0	Died
I.	"Immune" Serum	20	8=40%	8=40%	2=10%	1=5%	1=5%
II.	Normal Serum	16	6=37.5%	6=37.5%	3=18.75%	0	1=6.25%
III.	"Autotherapy"	20	8=40%	7=35%	5=25%	0	0
IV.	Lumbar Puncture	20	8=40%	8=40%	2=10%	0	2=10%
V.	0	28	10=38.5%	9=34.6%	8=30.8%	0	1=3.8%

REFERENCES.

[1] Flexner and Lewis: Epidemic Poliomyelitis in Monkeys, Fourth Note. Jour. A. M. A., 1910, liv, 45.

[2] Römer and Joseph: Spezifisch wirksames Serum gegen das Virus der epidemischen Kinderlähmung. Münch. med. Woch., 1910, lvii, 568.

[3] Flexner and Lewis: Experimental Poliomyelitis in Monkeys, Eighth Note. Jour. A. M. A., 1910, lv, 662.

[4] Netter: Bull. de l'Acad. de Méd., 1915, lxxiv, No. 41.

[5] Sophian: Specific Treatment of Infantile Paralysis. Jour. A. M. A., 1916, lxvii, 426.

[6] Wells: Immune Human Serum in the Treatment of Acute Poliomyelitis. Jour. A. M. A., 1916, lxvii, 1211.

[7] Zingher: The Diagnosis and Serum Treatment of Anterior Poliomyelitis. Jour. of the A. M. A., 1917, lxviii, 817.

[8] Amoss and Chesney: A Report on the Serum Treatment of Twenty-six Cases of Epidemic Poliomyelitis. Jour. of Exp. Med., 1917, xxv, 581.

[9] Le Boutillier: Am. Jour. Med. Sci., 1917, cliii, 188.

[10] Roby: Experience in an Epidemic of Poliomyelitis. N. Y. State Jour. of Med., 1916, xvi, 393.

[11] Discussion at the October Meeting of the Boston Society of Psychiatry and Neurology, 1916.

[12] Duncan: Autotherapy in Poliomyelitis. New. York Med. Jour., 1916, civ, 342.

[13] Wynkoop: Reflections on Poliomyelitis. Med. Rec., 1916, xc, 545.

[14] Flexner: The Nature, Manner of Conveyance and Means of Prevention of Infantile Paralysis. Jour. A. M. A., lxvii, 279.

[15] Fraser: Clinical Observations on Ninety Cases of Acute Epidemic Poliomyelitis. Am. Jour. of Med. Sci., 1914, cxlviii, 1.

[16] Barber: The Diagnosis and Treatment of Poliomyelitis. Med. Rec., 1916, xc, 142.

[17] Meltzer: The Treatment of Acute Poliomyelitis. N. Y. Med. Jour., 1916, civ, 337.

[18] Lewis: Report of 77 Cases of Acute Poliomyelitis Treated in the New York Throat, Nose and Lung Hospital by Intraspinal Injections of Adrenalin Chloride. Med. Rec., 1916, xc, 540.

[19] Hoyne and Cepelka: Poliomyelitis, with Some Observations on Thirty Cases. Jour. A. M. A., 1916, lxvii, 666.

TECHNIC AND INTERPRETATION OF DENTAL ROENTGENOGRAMS.*

By Herbert McIntosh, M.D., Boston.

Dental radiology is a special branch of the larger field of Roentgen diagnosis. For its successful pursuit it requires something of the special qualifications of the dentist—mechanical skill and deftness in working in contracted areas. There are difficulties which do not present themselves in other fields of x-ray diagnosis. A formidable difficulty, for instance, is the varying character of the surface against which the film is laid. Nothing varies more in different patients than the conformation of the palate against which the film must be laid when radiographing the teeth of the superior maxillary region. This necessitates a different position of the tube for each case, since it is necessary to avoid foreshortening or lengthening of the roentgenogram. As the problem of root canal fillings is one of great importance, and a never-failing source of anxiety to the dentist, it is necessary to furnish him correct *data* with regard to the size and direction of these canals. It can readily be seen that with roots foreshortened or lengthened the dentist may be misled, for instance, in determining the length of a root canal which, after several attempts at filling, may still remain unfilled.

A common source of error for the radiographer is to forget that the plane of the cheek is not exactly the plane of the tooth or the palate, though there is considerable correspondence between these planes in the skeleton. Where covered with muscle and other structures, these planes diverge somewhat more, though less than is commonly supposed. Where the plane of the film and that of the object to be radiographed diverge, the rule is to bisect the angle made by the plane of the film and that of the object, and so place the tube as to throw the rays at right angles to the bisecting line. The resulting radiograph represents the exact length of the object radiographed. Foreshortening and elongation of root canals are thus avoided.

A practical difficulty presents itself in the intolerance which many throats offer to the proper placing of the films. I have never found it necessary, however, to anesthetize the mouth and throat, patience and thoughtfulness usually enabling the operator to secure a satisfactory film.

I have never found film holders of any value whatever. The finger of the patient holds the film admirably in place, folds it into the desired position and keeps it there firmly. It is, of course, desirable that exposures should be brief to avoid movement resulting from breathing during the exposure. Movement obliterates the picture of the root canal, always of the greatest importance. Exposures lasting from three to five seconds furnish excellent results. In my judgment the film should not be too rapid. Powerful generators and slow films produce the best results.

It is of great importance so to place the film in the mouth as to get a position well beyond the apices of the roots. Inflammation shows itself first generally at the foramen of the tooth.

In order to obtain fine detail in the dental film it is necessary to keep the vacuum in the tube low. As tubes tend with use to increase their resistance to the passage of the current, this is a consideration of the highest importance. High tubes produce a flat picture with little differentiation of detail. A dental roentgenogram is a miniature, and depends for its value upon accuracy and beauty of detail. A tube, therefore, with the best regulating device on the market and a rather fine focus will aid in securing the best results. The tube stand should furnish a small diaphragm and cylinder for dental roentgenography.

Plate pictures are of no value whatever in dental radiography, except under unusual conditions. The shadows are necessarily superimposed to a considerable extent, and distortion is unavoidable. They are, therefore, rarely employed in dental roentgenography.

Films should be mounted upon cardboard or celluloid of suitable size for filing in cabinets. Small view boxes for studying films by transmitted light can now be obtained from supply houses, and are convenient and serviceable.

A subject of much interest is stereoroentgenography of the teeth. To introduce the third dimension into a shadow picture is to separate the various levels, which otherwise lie upon a flat surface and furnish no data for determining their third dimension relation. For radiographs of other parts of the body this presents no great difficulty, since the plate being in a fixed position it is necessary only to change the position of the tube in order to get a second view. In the mouth, however, the film has to be withdrawn, and a second introduced in exactly the same position as the first without change of position of the head itself. This offers many practical difficulties, so that failure to secure satisfactory results is frequent. Successes are, however, possible, and when obtained very satisfactory. The relation of unerupted teeth, the position of roots and fillings and many other obscurities may be thus cleared up.

The discovery that so-called rheumatic conditions and other disturbances of metabolism may have their origin in focal infections at remote points in the body has directed attention to the teeth as one of the sources of these troubles, and the extensive roentgenography of the teeth, which has become a routine procedure with many physicians, makes the interpretation of dental films of very great importance. What is the significance of the dark areas so frequently found at the roots of teeth? The healthy alveolus presents a mottled appearance due to the unequal deposit of lime salts. Where the alveolus has become unhealthy there is a dark area which entirely alters the picture. To what is this change due? We are always right in answering that it is due to absorption of the alveolar process. But we are not justified in answering always that it is due to the presence of pus. Here, I think, a serious error may arise, for while there may have been pus in the area at some time or other, it does not follow that there is pus now. Pus always produces absorption of the process, but if the infection has ceased, the destroyed area may show a dark spot on the film for perhaps a year or two years longer, until nature has infiltrated the tissues with the bony deposit.

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* Read before the New England Alumni Association of the New York City Medical Colleges, April 18, 1917.

Another error of interpretation may arise from the fact that the tissues through which the ray passes are of varying degrees of thickness, and produce occasionally dark areas which suggest an infective process. These occurring over the foramina of teeth may lead to errors of diagnosis. Thus the natural thinness of the lower edge of the mandible, the dark line of the inferior alveolar canal, the circular shadow of the mental foramen, the shadows above the floor of the antrum, and the dark areas above the superior incisors may mislead the untrained eye. Further confusion may result from the high lights produced by the edge of the zygomatic bone, sometimes simulating an unerupted tooth, and the coronoid process of the mandible appearing on the film just behind the third superior molar.

It is entirely probable that dark areas at the apices of teeth are, in many instances, due to the destructive effect upon the process resulting from arsenic employed in devitalizing pulps. A small quantity of arsenic runs out through the foramen, producing the same effect upon the alveolus as upon the pulp. This would mean necrosis, but without infection. On the other hand, a dark area at the apex of the root is undoubtedly due in many instances to an imperfect root canal filling. I hesitate to speak upon this subject because I recognize the extreme difficulty which confronts the dentist in the management of many of these cases of root canal fillings. Often the canal is twisted and curved, and many times so thread-like that it would seem impossible to carry a gutta percha point or other material to the foramen. And yet open and unfilled spaces are breeding-places for infective processes. No doubt in many instances these dark and infected areas are due to defective root canal fillings where there seem to be insuperable obstacles to the achievement of the end desired. Important as root canal filling is, there would seem to be ample justification for many failures, especially in the molar region.

In cases of pyorrhea alveolaris there can be no question as to the significance of these dark areas. They are areas of infection due to diminished resistance of the alveolar process to the attack of the germs, which appear to be normally present at times in every mouth. The appearance which pyorrhea presents on the film is characteristic. It is not the apex that is here chiefly involved, but the whole process—the interdental spaces as well as the apices.

It is frequently possible to differentiate between an abscess and a necrotic condition of long standing by the shape of the dark area. An acute abscess is sharply marked off from the surrounding healthy tissue. A necrotic condition of long standing has ragged and irregular edges.

Enough has been said to point out the necessity for care in interpreting dental films. Dark areas are not always indicative of infection, nor do they in all cases point to the necessity for extraction, or even treatment. They ought to be considered in the light of all the facts which the intelligent radiographer can gather from a careful consideration of the case. Patients ought not to be lightly advised to submit to a complete extraction of their teeth. No artificial dentures can ever take the place of the teeth which nature has furnished, even if the latter are not perfect. Teeth may willingly be surrendered if they are undeniably the sources of infection, but the case ought to be fairly well made out before giving such counsel. Dental roentgenography may be regarded as a most valuable aid in reaching a final judgment upon a most important question. In reaching this judgment, skill in interpreting the film is quite as important as technic in taking it.

My purpose has been chiefly to warn against possibilities of error in the interpretation of dental films. I might add that an area of infection at the root of a tooth might coincide with a neuritis or an arthritis or a possible cachexia, and yet not be the cause of it. Here, as in the interpretation of dental films, a certain caution in reaching conclusions might well be exercised.

* * *

PREPARATION OF ANIMAL FOOD PROTEINS FOR ANAPHYLACTIC TESTS.*

By R. P. Wodehouse and J. M. D. Olmsted, Boston.

[From the Medical Clinic of the Peter Bent Brigham Hospital, Boston.]

Since it is well known the proteins of some foods are frequently the cause of certain types of asthma and other anaphylactic diseases, and since by the application of the proteins from these foods by means of the skin test it is possible to determine the particular food which causes the disease, it is desirable to have for the skin test suitable preparations of all the foods that enter into the average diet. Such preparations must be in a form convenient to handle.

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* These preparations were made for the "[illegible] Bronchial Asthma" (Jour. Med. Res., 35, et seq.) at the Peter Bent Brigham Hospital, Boston.

and must also be as concentrated as possible, in order to make the tests certain. For preliminary tests, however, it is not necessary or even desirable to have the individual proteins, which occur in each of the foods, separated one from another. Otherwise, each food would have to be represented by three, four or often more individual proteins, thus greatly increasing the necessary number of tests to be made.

In order to produce the skin reaction, the proteins must be in a soluble form. Although many proteins become insoluble after being heated, this does not prevent the use of heat in making these preparations, because, as it has been shown, foods which ordinarily are eaten in a cooked condition give the skin test after being cooked for the table as well as or even better than when raw. Consequently, in making these preparations, from foods which are generally eaten in a cooked form, heat was applied in making the extracts. This, of course, entirely eliminated the heat coagulable proteins from these preparations unless they happened to be partly hydrolyzed by the cooking, in which case the products of hydrolysis would enter into the preparation.

No attempt was made to remove entirely other substances, because any lengthy process of purification would be liable to alter the nature of the proteins so that the preparations would not be the true anaphylactogenic representatives of the foods from which they were made.

It is necessary that preparations for this purpose should keep indefinitely, be convenient to handle and not be subject to putrefaction from air contaminations. For this reason they are dried and kept in the form of a powder.

For making these preparations the method used by the authors[1, 2] in the preparation of vegetable food proteins was modified in such a way as to be adaptable to meat and fish, since it yields the proteins in a highly concentrated form, and the preparations made by it are anaphylactogenically representative of the foods in the form in which they are generally eaten.

In general the method is as follows. The material is ground very fine in a meat chopper and heated with approximately two volumes of water to 90° C. for one half hour. The liquid is then strained off through cheesecloth and allowed to stand for a few days (using toluol as preservative); at the end of this time fats, if any, collect at the surface and are removed, the liquid is decanted from the sediment which usually settles out, and is filtered. Filtration is often slow and difficult on account of the gummy nature of the extracts. However, it is always possible to obtain eventually a clear or slightly opalescent filtrate. This filtrate is then exposed in large evaporating dishes upon the warm water bath before an electric fan until nearly dry (with chloroform as preservative). The result is usually a more or less hygroscopic gummy substance. This is then dissolved in as small an amount of water as possible and added to three or four volumes of 95 per cent. alcohol. This always causes the formation of a gummy or even syrupy precipitate which, probably on account of the hygroscopic nature of the peptones contained in it, shows a great avidity for water. Dehydration, however, can be completed by boiling and triturating in absolute alcohol, acetone and ether. The thorough washing given in these reagents also serves to remove all fats, oils and waxes. In removing the proteins from the baths of alcohol, acetone and ether, centrifugation is used in preference to filtration, since the process can thus be completed in much less time and with much less exposure to the atmosphere. This is important on account of the extremely hygroscopic nature of most of these preparations which in the presence of alcohol or acetone take up water so freely that an exposure of a few minutes is sufficient to render them liquid again; in this regard the animal food proteins show strong contrast to the vegetable food proteins. After the last ether bath the protein is removed to a sulphuric acid desiccator and drying is completed *in vacuo*. The result is always a friable powder which is readily soluble in water or dilute alkali.

The animal foods which we have so far prepared by this method are the following:

Pork
Beef
Lamb
Chicken
Haddock
Cod
Salmon
Halibut
Mackerel
Lobster
Oyster
Clam
(long necked)

In making the preparation from oysters alone the general method was deviated from in that heat was not applied. The oysters were simply ground and macerated in cold water for several days (with toluol as preservative). This was deemed advisable, because oysters are eaten raw as often as cooked.

When chemical tests were applied to these preparations, it was found that all gave the ordinary protein color reactions. The biuret was always red or reddish, and the precipitation reactions such as are obtained with phosphomolybdic, phosphotungstic, trichloracetic, picric acid, etc., indicated that in all cases the preparations consisted mainly of proteoses and peptones. No quantitative tests were made to determine the percentage of protein, but the qualitative tests showed that the proportion of protein in these preparations is very large.

This method of macerating the fish or meat in water, hot or cold, according to its nature, and precipitating the extract so obtained by alcohol, then thoroughly washing this precipitate in alcohol, and drying in absolute alcohol and ether, yields preparations which contain the protein in a form highly concentrated and representative of the food as it is generally used.

REFERENCES.

[1] W[illegible] BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxxvi, [illegible]

[2] W[illegible]

BODY TYPES IN EPILEPTICS.[*]

By Morgan B. Hodskins, M.D., Palmer, Mass.,
Monson State Hospital.

I have been much interested in the work of Dr. John Bryant and Dr. Joel E. Goldthwait in their study of body types and the relation of these types to disease, especially their possible relation to epilepsy.

Bryant divides the human family into three types: the carnivorous, the herbivorous and the normal. Goldthwait, in the Shattuck Lecture for 1915, described these types fully.

In the lecture just referred to, Goldthwait says, "The characteristics are equally apparent in childhood as in adult life." Therefore, the study was first undertaken on young patients, with the idea that they were better prospects for treatment. The oldest patient in this group was twenty-four years of age, the majority being between twelve and fifteen years of age.

There are one hundred and fifteen patients included in this study, which, on analysis, gave forty-seven carnivores, 40.8%; eight herbivores, 6%; and sixty normals, 52.1%.

The causes of the epilepsy in the carnivores, as determined by the clinical examination, are as follows:

Idiopathic, twenty-two; indigestion, seventeen; meningitis, four; diphtheria, two; hydrocephalus and alcohol poisoning, one each.

In the normal group the determined causes were: encephalitis, sixteen; meningitis, ten; cerebral hemorrhage, seven; birth injury, three; rachitis, six; blow on head, congenital syphilis, diphtheria, pneumonia and sunstroke, one each; measles, two; idiopathic, four; indigestion, seven.

On further analysis we find that, in the carnivorous group, 10% were due to organic causes, and in the normal group, 60%. In the carnivorous group we find six different factors to account for the onset in forty-seven cases. In the normals, thirteen factors account for sixty cases. Thirty-six per cent. of the carnivores and 48% of the normals had a hereditary tendency.

The average age at onset of the disease in the carnivorous group was 5.1 years, in the normals 2.85 years.

The group of eight herbivores was too small for profitable analysis.

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[*] A contribution to the William Leonard Worcester Memorial Series of Danvers State Hospital Papers, presented Nov. 19, 1915.

Book Reviews.

The Epidemic of Poliomyelitis in New York City in 1916, Based on the Official Reports of the Bureaus of the Department of Health.

A monograph of four hundred pages which incorporates a series of extensive reports of the infantile paralysis epidemic of 1916 has been issued by the Department of Health of New York. Beginning with a historical sketch of the disease and proceeding with the record of the epidemic in this City, with a reference to the extent of its spread elsewhere in the United States, the report deals with every phase of the disease as seen by the Department of Health, in co-operation with other departments of City, State and Federal Government, and with many official and unofficial advisory groups and organizations. The data here presented will render possible the widest use of the observations of the officers of the Department of Health by those engaged in the study and practice of preventive medicine in general and this dreaded disease in particular.

The Starvation (Allen) Treatment of Diabetes, with a Series of Graduated Diets. By Lewis Webb Hill, M.D., and Rena S. Eckman. Third Edition. Boston: W. M. Leonard. 1917.

The first edition of this convenient manual of the newer treatment of diabetes was reviewed in the issue of the Journal for October 7, 1915 (Vol. clxxiii, p. 551); and the second edition was reviewed in the issue for March 9, 1916 (Vol. clxxiv, p. 357). The appearance of this third edition within so short a time is evidence of the merited success with which the work has met.

The third edition has been generally revised and is increased by sixteen pages over the second. The diet lists and references have been rewritten and increased in number. The endeavor has been made to add such data as may increase the value of the book to physicians and patients. Particular attention is directed to the table presenting the analyses of diabetic foods done by the Connecticut Agricultural Experiment Station and exposing many of the foods, flours and meals advertised for diabetics as not only valueless but dangerous. The series of graduated diets has been completely revised and indexed; and in accordance with the latest advances in the knowledge of diabetes, most of these new diets contain less fat than there was in the old series, emphasizing the present belief in the important rôle played by a high fat intake in the production of acidosis. The book needs no introduction and may be expected to continue with increased efficiency its service to the profession.

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A NEW THEORY OF DREAMS.

It has not been long since Dr. Freud startled the scientific world with his new system of psychology, in which the interpretation of dreams plays such a prominent part. Owing to the enthusiasm of the supporters of his dream theory and the ardency of its detractors, most physicians are quite well aware of its essentials. They are, briefly, that every dream is the representation of a repressed wish; that besides its actual manifest content, a dream has a latent content which must be discovered; that there are numerous psychic mechanisms at work in dreams,—repression, distortion, symbolism, condensation, etc. Besides Freud's original theory, some of his disciples and his followers have elaborated many variations of this. Thus Stekel sees death and bisexuality in every dream. Adler thinks it is a representation of the individual's sense of inferiority, and Maeder holds that it has the function of indicating a solution of the conflict—in other words, of pointing out, in symbolic language, perhaps, the road out of the difficulty.

Just at this time it is instructive to hear the subject of dreams presented, not in order to make a violent attack upon the psychoanalytic school, but merely as an attempt to epitomize scientific knowledge. This has been done by Dr. Robert Armstrong-Jones, who gave the result of his studies in a recent address to the Abernethian Society as reported in the *Lancet* for November 25, 1916. After giving some attention to the historical aspect of the subject, he discusses the relation which dreams bear to the senses, finding that the majority of them relate to sight, and only a very small percentage of them to hearing, taste, and smell.

Dr. Armstrong-Jones considers that the characteristic feature of dreams, considering them as mental processes, is that the will is in abeyance, while cognition and feeling play prominent parts. These three factors, which he considers the *sine qua non* of mental processes, become dissociated then in dreams and the will refuses to act. This he holds in spite of the not uncommon assertion by certain persons that they can direct their dreams. Speaking briefly of the psychoanalytic dream theory, the lecturer held that the chief danger was in arbitrarily investing dreams with a ruling thought, such as sex, when in reality other instincts, such as fear, anger and hunger may just as commonly figure in them.

Dr. Armstrong-Jones believes that impressions and associations which had been discarded during our waking hours as not pertinent to our welfare, find their way into the sleeping life and by reason of the fact that they had been given no scrutiny during our waking hours present a vague, disconnected appearance. Thus the parts of the mind that have been occupied throughout the day with certain essential ideas are allowed to relax, these ideas are stored away, so to speak, and new ideas are brought forth, other sections of the brain come into play and allow the ponderous parts to rest.

PROFITING BY THE MISTAKES OF OUR ALLIES.

If the medical profession, in conducting its part in the present war, may learn from the mistakes of the English and French to their advantage, they must urge the matter of proper selection of physicians for military service. Large numbers of doctors will be needed not only to care for our own troops, but to fill the vacancies left by the lack of forces among the Allies, not only on the western front but in Russia and other eastern points. To supply her army's needs, France depleted the staffs of her medical schools, her civilian hospitals and laboratories. Those who remained were insufficient to give proper training to the coming medical classes and to afford proper protection to the civilian population. England made the same mistake. She accepted all the physicians who volunteered for the army and later found her medical ranks thinned to an alarming extent. There is today in this country, roughly speaking, one doctor for every 700 of our population. In England there are large sections where there remains only one doctor for every 8000 population, and France is in a worse plight. Therefore, whether such a system is made into law or not, we must apply to the calling of our medical force the same prinicples that control the draft of the Army. Those that can be spared at home must go, those who are more useful at home should be kept there. Our great city hospitals must not be crippled, and at all costs we must preserve adequate faculties for our medical schools, and keep them in full operation, so that the ranks of medicine may always have recruits. Medical students should be exempt from draft and not accepted for volunteer service.

TRAINING IN MILITARY ROENTGENOLOGY.

A plan put forward by the Council of National Defense, for the establishment of schools in military roentgenology, was noted in the Journal for May 17, 1917 (Vol. clxxvi, No. 20.

At that time a committee consisting of twenty-seven roentgenologists was appointed by the president of the American Roentgen Ray Society to provide means whereby instruction could be given to men desirous of entering the medical corps as roentgenologists. The duties of this committee were to canvass the country for a complete list of medical men available for military roentgenology, to establish schools in different geographical centers where uniform instruction could be obtained and to prepare a manual of military roentgenology. The work of organization has now been completed and eight schools have been established. These are at Boston, New York, Baltimore, Richmond, Philadelphia, Kansas City, Mo., Los Angeles, and Chicago. The school in Boston opens on or about the twentieth of July. The course of study covers the practical application of roentgenology, with clinics at the hospitals, special work on localization of foreign bodies, military administration and the scientific study of apparatus. Major A. W. George is in charge. Members of the Medical Reserve Corps or those who prefer to receive commissions in the Medical Reserve Corps as military roentgenologists can, upon receiving their commissions, be assigned to one of these several schools of instruction, by application to the Surgeon-General's Office, Washington, D. C.

MEDICAL NOTES.

British Birthday Honors for Physicians.—The list of British honors, recently conferred upon the occasion of the observance of the King's birthday, contains the names of a number of physicians. Among these Dr. Frederick Taylor, president of the Royal College of Physicians of London, and an active member of the Central War Committee, has been created a baronet. The honor of knighthood has been conferred on a number of physicians, notably Col. Robert Jones, C.B., A.M.S., inspector of military orthopedics, and Surgeon-General Eugène Fiset, long an officer on the permanent staff of the Canadian Army Medical Corps.

"He went with the first Canadian contingent to South Africa, serving throughout the war and being taken prisoner. For his services at Paardeberg he received the D.S.O. In 1905 he became Director-General of Medical Services, Canada, but in 1907 he took over the work of the deputy Minister of Militia during the illness of the incumbent of that office; after that minister's death he succeeded to the post, Sir Eugène Fiset's place as Director-General being taken by Suregon-General Carleton Jones. Sir Eugène Fiset was largely responsible for the organization of the Canadian contingent sent to take part in the present war. The honour of knighthood is also conferred upon Sir Thomas Kennedy Dalziel, who is lecturer on Clinical Surgery in the University of Glasgow, and surgeon to the Western Infirmary; on Sir E. C. Stirling, C.M.G., professor of physiology in Adelaide University, at one time lecturer on the subject at St. George's Hospital, and a well-known authority on the anthropology of Central Australia; and on Sir Herbert Waterhouse, surgeon to Charing Cross Hospital and Dean of the school, who has recently returned after serving for nearly a year with the Anglo-Russian hospitals in Russia. Of the military honours, the first to catch the eye is the promotion of Sir Arthur Sloggett, K.C.B., Director-General with the British armies in France, already C.M.G., to be K.C.M.G. The same honour is conferred upon Surgeon-General Tom Percy Woodhouse, C.B., who was the D.M.S. of the original expeditionary force, and now holds the onerous and exacting office of D.M.S. of the lines of communication; and upon Surgeon-General Francis Treherne, C.M.G., who was D.M.S. in Mesopotamia during the reorganization of the medical arrangements of the expeditionary force there. The other recipient of this honour is Colonel Robert Neil Campbell, C.B., I.M.S., who was in command of the Pavilion Military Hospital for Limbless Soldiers, Brighton. Lieutenant-Colonel P. J. Freyer, who is made K.C.B., retired from the Indian Medical Service some years ago, but has long been consulting surgeon to Queen Alexandra's Military Hospital, Millbank. Soon after the war began he became consulting surgeon to the Indian Hospitals at Brighton, and afterwards consulting surgeon to the Eastern Command, with charge of the county of Sussex. The same honour has been conferred on Colonel James Magill, A.M.S., who served with the Guards Camel Regiment during the Nile campaign of 1885, and was severely wounded at Abu Klea. He also served during the South African war."

Moving Pictures in Teaching.—The use of moving pictures in photographing surgical operations has been tried and proved successful. The proceedings of the annual meeting of the American Institute of Dental Teachers, held in January, 1917, records the use of moving pictures to teach dentistry. The Clinical Film Company of New York, who have been successful in making records of surgical operations for educational purposes, became interested in testing out the possibilities of motion pictures for use in the illustration of lectures in dental schools. Six reels were made and presented to the Association. Reel No. 1 showed a method of filling a cavity in the grinding surface of a molar tooth with a non-cohesive gold foil filling by the cylinder method and hand pressure. Reel No. 2 showed an operation for the removal of teeth under nitrous oxid anesthesia. Reel No. 3 showed a prophylactic treatment of dentures. No. 4 illustrated the removal of impacted third molars by two methods. No. 5 showed a root amputation under anesthesia and No. 6 illustrated the system of dental hygiene and prophylaxis employed in the Bridgeport, Conn., public schools. The demonstration was received with enthusiasm by the association.

Large Charitable Bequests.—By the will of the late Colonel Oliver H. Payne of New York, one of the largest owners of Standard Oil Stock, the Lakeside Hospital of Cleveland, Ohio, is the recipient of a gift of $1,000,000. St. Vincent's Charity Hospital of the same city receives $200,000.

WAR NOTES.

Dr. Alexis Carrel's Arrival.—The arrival in this country of Dr. Alexis Carrel is announced. Dr. Carrel reached New York on July 4 and will give valuable assistance to the establishing in this country of proper hospital facilities for the care of the wounded.

War Relief Funds.—On July 13 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$237,884.20
Armenian Fund	199,836.74
Permanent Blind Fund	117,686.65
French Orphanage Fund	115,091.99
Surgical Dressings Fund ...	105,173.47
Serbian Hospitals Fund	96,333.44
Italian Fund	42,643.42
La Fayette Fund	28,298.03
War Dogs' Fund	806.25

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending July 7, 1917, the number of deaths reported was 211 against 215 for the same period last year, with a rate of 14.25 against 14.74 last year. There were 29 deaths under one year of age, against 32 last year, and 65 deaths over 60 years of age against 57 last year.

The number of cases of principal reportable diseases were: diphtheria, 53; scarlet fever, 13; measles, 128; whooping cough, 11; tuberculosis, 55.

Included in the above were the following cases of non-residents: diphtheria, 5; tuberculosis, 13; whooping cough, 2.

Total deaths from these diseases were: diphtheria, 6; scarlet fever, 2; measles, 2; tuberculosis, 35.

Included in the above were the following cases of non-residents: diphtheria, 1; scarlet fever, 1; tuberculosis, 5.

Sharon Sanatorium.—The extension of the work of the Sharon Sanatorium, to include the treatment of tuberculous children, is an endeavor worthy of this excellent institution and merits the loyal support of the public.

The Sharon Sanatorium was established twenty-six years ago, in 1891, for the treatment of tuberculosis arising in women of refinement and limited means. It was the first of its kind in New England; and the first to prove that tuberculosis could be successfully treated in low altitudes, not far from the sea, in a rough, changeable climate. It is now known throughout the United States as a pioneer and model institution. Its success, after a short time of experimentation, was such that several years later a State Sanatorium at Rutland, Massachusetts, the first one of many such state institutions, was opened for the very poor.

As a fitting mark of its twenty-fifth anniversary, the Children's Pavilion was begun in 1916 for the treatment of tuberculous children under fourteen years of age, and this is now well under way on the Sanatorium grounds. It is to be an open-air school and sanatorium. The importance of early treatment of suspected tuberculosis in children cannot be overestimated. The officers of the Sanatorium are, therefore, exceedingly desirous that the benefit of their experience may be immediately made available to children, and are asking that money, not only for current expenses but for the endowment fund and the Children's Pavilion, may be provided in generous quantity. Checks and pledges may be mailed to any member of the following committee: Dr. Vincent Y. Bowditch, chairman, William T. Sedgwick, Dr. Joel E. Goldthwait, Mrs. Charles A. Porter, Nathaniel H. Stone, Mrs. Henry P. King and Jeremiah Smith, Jr.

NEW ENGLAND NOTES.

New England Tuberculosis Conference.—A conference on tuberculosis, to include all New England, will be held in Rutland, Vermont, on October 4th and 5th of this year. A committee of fifty in the New England states has been appointed to help make this conference a success. Local members of this Committee are as follows: Dr. Edward O. Otis, Boston; Dr. Arthur K. Stone, Boston; Dr. Vincent Y. Bowditch, Boston; Dr. Allen J. McLaughlin, State Com. of Health, Boston; Mrs. Thomas Conant, Gloucester; Dr. Donald B. Armstrong, Framingham; Seymour H. Stone, Boston; Dr. John B. Hawes, 2nd, Boston; Miss Mary Van Zile, Beverly; Dr. Joseph H. Pratt, Boston; Dr. I. J. Clark, Haverhill; Dr. George L. Schadt, Springfield.

Many phases of the tuberculosis problem will be dealt with. Because of the relation of tuberculosis to the war the conference should attract many delegates from different parts of New England.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

Franklin.—The regular bi-monthly meeting of the Franklin District Medical Society was held at the Mansion House, Greenfield, on Tuesday morning, July 10, at 11.15 o'clock.

The following papers were read: "Management of Labor," by Dr. G. P. Twitchell; "Ear Complications of Infectious Diseases," with case reports, by Dr. F. A. Millett.

Dr. H. N. Howe, *Pres.*,
Dr. F. A. Millett, *Sec.*

Miscellany.

UNITED STATES VITAL STATISTICS IN 1915.

The census bureau of the United States Department of Commerce has recently completed and issued a survey of birth and death rates in the United States in 1915, affording a basis of comparison with similar statistics in other countries.

"In the recently established birth-registration area of the United States—comprising the six New England States, New York, Pennsylvania, Michigan, Minnesota, and the District of Columbia, with an estimated population of 31,150,000, representing 31 per cent. of the total for the United States—776,304 infants were born alive in 1915, representing a birth rate of 24.9 per 1,000 of population. For every state in the registration area and for most of the cities there was a substantial excess of births over deaths, but this excess was most pronounced in those localities in which the proportion of foreign population is largest. The mortality rate of infants under 1 year of age averaged 100 per 1,000 births, ranging from 70 in Minnesota to 120 in Rhode Island, and, among places having 25,000 inhabitants or more, from 54 in Brookline and Malden, Mass., to 196 in Shenandoah, Pa. These are among the significant facts presented in a preliminary statement just made public by Director Sam. L. Rogers of the Bureau of the Census, Department of Commerce.

"This statement—giving, as it does, the first Federal statistics of births ever published—makes possible a comparison of birth rates in the registration area of the United States and in foreign countries, and throws light on such matters as the extent to which the populations of the states and cities in the birth-registration area are increasing through excess of births over deaths, the relation between the birth rate and the rate of infant mortality, the relation between the birth rate and the racial composition of the population, etc.

"The birth rate for the birth-registration area as a whole in 1915—24.9 per 1,000 population—exceeded the death rate for the same area—14 per 1,000—by 10.9 per 1,000, or nearly 78 per cent. That is to say, if the birth and death rates prevailing in that year were to remain unchanged, and if no migration were to take place to or from the area to which the figures relate, its population would increase annually by 10.9 per 1,000, or by nearly 1.1 per cent. The birth rates of the registration states ranged from 21.1 in Maine to 26.7 in Connecticut and Michigan; and the death rates ranged from 10.1 in Minnesota to 16.1 in New Hampshire. The highest death rate was thus much lower than the lowest birth rate. The greatest excess of births over deaths—14.4 per 1,000 population—appears for Minnesota, and the smallest—5.5 per 1,000—for Maine.

"The statistics cover 96 cities and towns having, at the last census, 25,000 inhabitants or more. Of these, there were only three—Kingston and Troy, N. Y., and Norristown, Pa.—in which the deaths exceeded the births in 1915, and in each case the excess was small, being greatest—1.1 per 1,000 population—for Troy.

"The cities showing the highest five birth rates are: Detroit, Mich., 37.9; Chicopee, Mass., 37.6; Niagara Falls, N. Y., 37.5; New Britain, Conn., 36.4; and Chelsea, Mass., 34.5. The death rates for these cities—15.7, 14.7, 16, 11, and 14.3, respectively—were, with the single exception of that for New Britian, higher than the average for the birth-registration area but were far below the maximum death rate shown for any city in the area—21.7, for Norristown, Pa.

"The lowest five birth rates appear for Brookline, Mass., 12.7; York, Pa., 17.5; Kalamazoo, Mich., 18.2; Kingston, N. Y., 18.5; and Troy, N. Y., 18.6. The death rates for the first-named two places were lower than the average for the registration area, and those for the first-named three were lower than the corresponding birth rates; but for Kingston and Troy the death rates —18.6 and 19.7, respectively—exceeded the birth rates.

"The relation between the birth rate and the constitution of the population in respect of race and nativity is of great interest. For the six cities in the registration area in which the colored population at the last census either numbered more than 10,000 or represented more than 10 per cent. of the total, separate figures are given for the white and colored races; and in all but one of these cities—Washington, D. C. —the birth rates shown for the colored population were lower than those for the whites. It is probable, however, that the registration of births is less nearly complete among colored than among white persons, and that therefore the rates shown for the former class are too low. The death rates for the colored population are higher, and in many cases much higher, than those for the whites.

"The birth statistics do not, of course, show the number of children per family, but some indication of the fecundity of the native and foreign elements of the population may be obtained from a comparison between the proportion which the number of foreign parents formed of the total number of white parents to whom children were born in 1915 and the proportion which foreign-born persons represented of the total white population in 1910. From such a comparison it appears that far more births occur annually to foreign-born parents, proportionally to their number, than to native parents. In Connecticut approximately 30 per cent. of the white population in 1910 was of foreign birth, but nearly 63 per cent. of the white parents to whom children were born in 1915 were reported as natives of foreign countries. The corresponding percentages for the other states and the District of Columbia are as follows: Maine, 15 and 28; Massachusetts, 31 and 58; Michigan, 21 and 35; Minnesota, 26 and 33; New Hampshire, 22 and 44; New York, 30 and 56; Pennsylvania, 19 and 40; Rhode Island, 33 and 59; Vermont, 14 and 25; District of Columbia, 10 and 17.

"Thus, on the assumption that the proportions of native and foreign-born persons in the total white population did not change materially between 1910 and 1915, it appears that the birth rates for the foreign-born population in most of these states and in the District of Columbia are nearly or quite twice as high as the rates for the native and foreign elements combined, and that, on the other hand, the rates for the natives are considerably lower than those for the entire white population, being little more than half as high in the case of Connecticut and less than two-thirds as high in the case of Massachusetts. On the basis of these figures—which of course represent only an approximation to the facts—the excess of the birth rate among the foreign-born population over that among the natives ranges from about 40 per cent. in Minnestota to about 300 per cent. in Connecticut. It should be borne in mind, however, that the proportion of the population in the reproductive period of life is considerably greater for the foreign born than for the natives.

"The rate of infant mortality—that is, the number of deaths of infants under 1 year of age per 1,000 born alive—is of particular interest. This rate, for the registration area as a whole, was 100 in 1915. This is practically equivalent to saying that of every ten infants born alive, one died before reaching the age of 1 year.

"Among the ten states these rates ranged from 70 for Minnesota to 120 for Rhode Island; and among the 96 cities and towns it varied from 54 for Brookline and Malden, Mass., to 196 for Shenandoah, Pa. The maximum rate was thus nearly four times as high as the minimum.

"It might be expected that a high rate of infant mortality would accompany a high birth rate, but an examination of the figures fails to disclose any well-defined relationship of this character. Among the States, both the highest and the lowest infant-mortality rates—120 for Rhode Island and 70 for Minnesota—are found in connection with birth rates—23.1 and 24.5 per 1,000 population, respectively—which are below the average for the registration area; and, moreover, the birth rate in the State with the lowest infant mortality is higher than that in the State with the highest infant mortality.

"Among the cities and towns the lowest infant-mortality rate—54 per 1,000 births—is shown for both Brookline and Malden, Mass. The former place had the lowest birth rate—12.7 per 1,000 population—given for any city or town in the registration area, but the birth rate of the latter—23.5 per 1,000—was not far below the average for the area. The highest infant-mortality rate—196 per 1,000 births, for Shenandoah, Pa.—is accompanied by a birth rate—32.7 per 1,000 population—which is far above the average, although considerably below the maximum. Of the ten cities in which the birth rates were highest, three show infant-mortality rates lower than the average, and of the ten places in which the birth rates were lowest, five show infant-mortality rates higher than the average.

"The statistics compared with foreign tables show that England, France, Belgium, Sweden and Switzerland before the war had a lower birth rate than the United States had in 1915. Countries with a higher rate were Germany, Austria, Russia, Italy, Spain, Denmark, Holland, Japan and Australia."

COMMUNICABLE DISEASES IN MASSACHUSETTS IN 1916.

Dr. Eugene R. Kelley, director of the division of communicable diseases of the Massachusetts State Department of Health, has recently issued his annual report for the year 1916, dealing particularly with epidemics of infectious diseases during that year and in the preceding decennial.

"A compilation of the deaths caused by ten of the most prominent communicable and preventable diseases shows that during the year just passed there were slightly more than 9000, or 17 per cent. of all the deaths. Twenty years ago deaths from these same diseases amounted to 13,600, or 30 per cent. of the deaths from all causes, and at the same time the population of the State was about 1,250,000 less than it is today.

"Although the number of cases in certain diseases showed marked increases, the total number of cases in all diseases last year was 68,488, and in 1915 was 71,900. Among those showing great increases are infantile paralysis, which spread to 1793 more persons in 1916 than it did in 1915, measles with an increase of 3300, anthrax and trichinosis. Twenty cases of the latter were traced to an infected hog which one slaughtering house refused and which was later taken and sold to some Italians.

"Among the diseases which showed a decrease are diphtheria, which fell from 9282 to 7338 cases; ophthalmia, which decreased 900 cases; scarlet fever, several hundred, and typhoid fever, 673.

"Perhaps the one fact which pleases the health authorities more than anything else is the record made in the fight against typhoid fever. In the year just past the authorities predict that there will be not more than 170 deaths from the disease at the outside, while there were 246 deaths from that cause in 1915. This, Dr. Kelly believes, is a rate for the State which has never been approached before, and he is confident that no other State has ever equalled it. In 1915 the rate per 100,000 population was 6.7, and in 1916 he predicts that it will not be much more than 5, and possibly less.

"A compilation of figures in regard to the infantile paralysis epidemic also shows some surprising facts. The little town of Dalton led the State in the number of cases in proportion to her population and had a rate of 433, based on a population of 100,000. Amesbury is the next with a rate of 268, Holyoke third with 188, North Adams fourth with 172.4, and Pittsfield fifth with 161.9. Worcester had the lowest rate with 14.4; Lowell was next lowest with 15.7, and New Bedford third from last with a rate of 16.9. Boston is seventeenth in the list with a rate of 64.4, and Cambridge sixteenth with a rate of 65.6. Fall River and Brockton are the only large cities of the State which had less than fifteen cases of the disease.

"In connection with this disease, the report declares that the district health officer system has been given a great test, for, with the exception of the cases in a few of the large cities, these officers saw every infantile paralysis sufferer in the State and even those suspected of having the disease. Their knowledge proved of great assistance to the local boards of health, and was responsible for the reasonable regulations which were put in force, rather than some very drastic steps which might have been taken.

"The deaths from measles in the year just past will run far beyond those caused by scarlet fever. It is estimated that there will not be many more than 117 from the latter, while there were 307 deaths from measles up to Nov. 1, or twice as many as in 1915. There were more whooping cough deaths, although less cases than in 1916.

"Speaking of outbreaks, the report states that there were two of anthrax in Woburn and Winchester during the past year, but that the United States Government has remodelled its protective regulations since that time on the representations of the Massachusetts Health Department. Two outbreaks of dipththeria occurred in institutions, but antitoxin was administered early and no deaths resulted. One small contact epidemic occurred in Amherst with a sub-epidemic traced to milk. Fitchburg had an epidemic which was prolonged throughout the year and there were nineteen other distinct ones.

"The largest scarlet fever outbreak took place in Quincy, where 187 cases of the disease resulted from unrecognized carriers. A small outbreak occurred in Clinton from milk. Two outbreaks of smallpox, both of them traced to a single source, occurred in Fitchburg and Lee and Great Barrington. Nine persons contracted the disease in the former and eighteen in the latter.

"There was only one typhoid epidemic of any consequence during the year, and that occurred in Lynn during the summer. In all 114 cases resulted, although the carrier was never discovered. Fall River also had a milk epidemic of twenty-eight cases, and there were three other small outbreaks from milk in which the typhoid was traced to the dealer.

“The laboratory work of the health department has shown an increase of thirty-four per cent. over that of other years, and diagnosed chiefly diphtheria, typhoid and tuberculosis.

“The Health Department has been aided greatly by the secretary's office towards making the record of deaths more complete. That office was forced to reorganize its whole routine in order to accommodate the health department, and now the records are made up monthly, only a month behind, whereas before they were at least a year behind.”

BOSTON VITAL STATISTICS IN 1916.

The Boston Health Department has recently issued a provisional statement of the vital statistics of this city for the year 1916. During this year the total death rate of the city was 16.72 as compared with 16.06 in 1915, the lowest figure recorded. The increase was due to several epidemics of streptococcus throat infection, the epidemic of poliomyelitis, and the Summer Street bridge accident. Not all death reports for the year have yet been received, so that the figures are only approximate and subject to subsequent modification.

“The deaths for the year numbered 12,717, compared with 12,021 in 1915. Of the total for 1916, deaths of non-residents numbered 1795, compared with 1640 in 1915, and known deaths of Bostonians outside the city numbered 675, compared with 704 in 1915. Corrected for these two factors, the 1916 death rate per 1000 population is 15.25, compared with 14.81 in 1915.”

The total number of deaths in 1916 showed an increase of 696 over the previous year.

“Non-residents dying in Boston account for some of this increase, as there were 155 more than last year. Each year more and more non-residents take advantage of our hospitals, these constituting 14 per cent. of our total deaths, and as these deaths must be figured in our death rate, it can be seen how our death rates are kept high. This feature is especially noticeable in the communicable diseases. Surrounding cities and towns send their cases here for treatment. Of the 26 deaths from typhoid fever, 7 of them were non-residents. Scarlet fever was much higher—almost 50 per cent., of 19 of the deaths being those of non-residents of Boston; diphtheria showed 52 of these non-residents.

“During the early part of the year, the outbreak of influenza and pneumonia was responsible for an increase of more than 200 deaths. To this increase may be added the increase of 164 deaths from poliomyelitis, and the unfortunate electric-car accident at South Boston, which caused 48 more.

“It is gratifying to note the decrease in the number of deaths from typhoid fever, scarlet fever, diphtheria and whooping cough; the low number of deaths from typhoid fever and the typhoid fever death rate being the lowest ever attained in this city, and up to this writing the lowest ever reached by any large American city having more than 350,000 population.

“While the total number of deaths of children under one year was 10 more than in 1915, and the infant mortality rate was 105 per 1000 births reported against 104 last year, some significance must be placed on the fact that there were outbreaks of influenza, pneumonia, and anterior poliomyelitis, all at different periods during the year, resulting in a great number of deaths of infants under one year of age.

“Only on two other occasions since 1882 has there been a lower number of deaths of children under one year of age. In this connection it might be said that nurses of this department visited almost 15,000 babies, and made subsequent visits totalling about 75,000.”

The total number of births reported in 1916 was 19,583 and the infant mortality rate was 105 per thousand births reported.

With reference to the West End Health Unit on Blossom Street, Dr. Mahoney says in his statement accompanying the report that: “On March 1, 1916, through the efforts of His Honor the Mayor, there was inaugurated in the West End section of the city a health unit which has since developed into a civic center as well. This was established for the purpose of getting in close touch with the people and determining what effect education of the people, through the coöperation of all health agencies in the district, would have on the prevention of disease and deaths amongst infants and children and adults in that congested area of the city.

“His Honor felt that the first place to start such an institution would be where the congestion was greatest and in a section that contained the greatest number of people per acre.

“The success of the Unit soon became apparent and wonderful results were accomplished for the people of the district during the hot summer of last year. Nurses, visitors and physicians kept constantly in touch with the people using the Unit as headquarters, and with the outbreak of poliomyelitis in the city the advantages of the Unit were shown to a still greater extent.

“The Unit seemed to be a Mecca for the afflicted and the worried, and the women and children came with their troubles, and oftentimes imaginary illnesses, only to be sent home with their fears allayed and themselves comforted. The physicians and nurses kept in close touch with the people during this outbreak, and the security that the people in the district felt in having such assistance about them did much to help them.”

PREPARATIONS OF UNITED STATES ARMY MEDICAL CORPS IN MEXICO.

Report from San Antonio, Texas, on November 24, 1916, described in detail the preparation which, during the previous summer, had been made at the Mexican frontier by the United States Army Medical Corps, for the care of sick and wounded troops, in the possible event of actual hostilities with Mexico.

"Within the last five months the most complete medical organization known to the United States Army has been developed to care for the 15,000 State and regular troops stationed at Border points and in Mexico. The system includes five base hospitals, located at strategic points; eight camp hospitals, a cantonment hospital at Columbus, N. M., and twenty-six ambulance companies and forty-one field hospitals.

"The base and camp hospitals will accommodate 4600 patients and have medical and surgical facilities equal to the finest hospitals. Not more than half the beds have been occupied at any one time since the nation's militia strength was called into the Federal service.

"Back of this array is the potential organization. A hospital train of ten Pullman cars, capacity 250 patients, would transport patients from the camp to the base hospitals and from base hospitals to general military hospitals in various parts of the country, should a campaign in Mexico be undertaken. These larger institutions are the Walter Reed Hospital at Washington, D. C., the General Army and Navy Hospital at Hot Springs, Ark., and the Lettiman Hospital at San Francisco. About 1200 beds are vacant in the three hospitals at the present time.

"In addition, a number of army posts have been selected for transformation into general hospitals in case of emergency. This list includes Fort McPherson, at Atlanta; Fort Oglethorpe, also in Georgia; Fort Benjamin Harrison, Indianapolis, and other army stations where barracks are available for hospital purposes.

"The medical corps has complete equipment in storage for twenty evacuation hospitals and two base hospitals. An evacuation hospital takes care of 300 patients and a base hospital accommodates 500, so the total reserve equipment ready for use at a moment's notice is sufficient for 6000 men. Evacuation hospitals are entirely under canvass and are intended for use along an extended line of communication.

"The base hospitals now in service are located at Fort Sam Houston, Fort Bliss, Brownsville, Eagle Pass and Nogales. Serving feeders for these institutions are the camp hospitals located at the following points: Laredo, 120 beds; Del Rio, 75 beds; Marfa, 150 beds; Deming, 180 beds; Douglas, 300 beds; Llano Grande, 200 beds; McAllen, 150 beds; and Fort Clark, 150 beds.

"Last July when State troops began arriving at the Border the only army establishments for the care of sick were the post hospitals at Fort Sam Houston and Fort Bliss, and much smaller places at Laredo and a few other Border points. Practically the entire system of base and camp hospitals has been built since the call on the National Guard was made.

"As a result of the scientific methods adopted by the medical corps and the steps taken to insure absolute sanitation in Border camps, the big command of regulars and militia has set a new health record. From May 1 to Oct 31, there were only 75 deaths from disease in the force of more than 150,000, and of this small number, only 21 deaths were due to infectious maladies.

"Typhoid fever was formerly the worst scourge of camp, but it has no place among the troops along the Mexican Border. May 1, to Oct. 18, only 24 cases of typhoid developed and no deaths resulted from the disease. All of these cases were among the National Guard organizations, where in some cases the men were not inoculated with typhus serum until after regiments had come to the Border. There was not a single case among the 42,000 troops of the regular army engaged in patrol duty and stationed in Mexico with General Pershing's command.

"In Spanish-American War days—over a period of eight months in 1898—among 147,000 regulars and volunteers, the typhoid epidemic reached the enormous total of 21,000 cases and there were 2192 deaths from the disease.

ANNUAL CONFERENCE, MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.

The recent conference on feeble-mindedness, held by the Massachusetts Society for Mental Hygiene, was marked by a series of addresses of much value and interest. Chief among them may be mentioned the address by Dr. Guy G. Fernald on the results of mental examination of young adults at the Concord Reformatory. He stated, among other things, that forty-four per cent. of the inmates of that institution are subnormal mentally and fifteen per cent. are feeble-minded. This statement is based on a study of 1107 individuals. Only forty per cent. he rates as normal and responsible, the other sixty per cent. are made up of psychopathies, epileptics, congenital syphilitics, sex perverts, the insane and feeble-minded.

The group of feeble-minded, 15 per cent. of the whole, he feels should be segregated from the others. "Members of this group are demonstrably defective and of limited responsibility, and as such should not be sentenced to serve with the fully responsible," he said, "but should be committed to a specially adapted environment for indefinite custodial care and training, with a view to their return to society only when such return would not be a menace.

"Absolute physical separation of the group is of vital importance, and preferably this should be in a farm colony of which the hospital and laboratory features are prominent. Until such segregation is made possible, work in the interest of the prisoner who is normal mentally is greatly handicapped."

Dr. Fernald urged, also, that psychiatric clinics be established in connection with the courts, so that offenders of this type may be committed to custodial care.

Speaking on what he termed practical methods for protection, education, supervision and segregation of the feeble-minded, Dr. Walter E. Fernald advocated the following plans: Long-continued scientific study and research of all phases of feeble-mindedness; govermental cognizance of all neglected and uncared for feeble-minded persons; continued census for the unfortunates; extra institutional supervision of all uncared-for defectives; special classes for the education on this subject in all cities and towns; mental clinics for diagnosis all over the State; mental examination of persons accused or convicted of crime and the education of lawyers, teachers, physicians and clergy as to the nature of feeble-mindedness.

Dr. Elizabeth A. Sullivan, resident physician at the Massachusetts Reformatory for Women at Sherborn, said that only 10 out of 234 women admitted to the institution were free of disease and possessed of adult intelligence. She urged the need of separating the feebleminded from reformatories and said that 4000 of the feeble-minded women discharged from the Sherborn Reformatory should have been placed in a suitable institution instead of being set adrift in the world.

The problem from the point of view of the social worker was brought out by J. Prentice Murphy, general secretary of the Boston Children's Aid Society, who stated that annually about 300 unmarried mothers, or one-third of the whole number in the city, call upon that Society for aid, and that in a group of 250 feeble-minded mothers none could tell the name of her child's father. Some of these feebleminded women have as many as six illegitimate children. Mr. Murphy advocated the separation of the mother from her baby and its care being entrusted to the State. Twenty charitable organizations in Boston have under their care 1600 persons who have been diagnosed as defective mentally.

Dr. V. V. Anderson, psychiatrist, Boston Municipal Court, in speaking on the subject of feeble-mindedness as seen in court, gave the following statistics:

"Not more than 10 per cent. of the offenders brought to the Boston Municipal Court are feeble-minded, but that 10 per cent. is most troublesome, mainly because society has not yet come to recognize its needs. Out of 100 cases 75 per cent. are not self supporting and 34 per cent. do not work at all. These 100 have a record of 1825 arrests and 735 sentences. The chances are four to one that they will not conduct themselves normally for six months when placed on probation. It would have been more profitable for society to have recognized these cases earlier and segregated the 75 per cent. who have a mental level below 12 years of age."

SELF-CONTROL IN DIET.

In Southern California, several ages ago, the oil escaping from a small spring formed in a depression of the earth, a little pool. The lighter portions of the oil evaporated, leaving the sticky asphalt. From time to time the rains covered the surface of the pool with water, animals and birds came down to drink, sank into the asphalt and were imprisoned in this gigantic animal trap. The hungry wolves saw there before their eyes fresh animal food of every sort, from the enormous mastodon to the smallest bird. They, too, were drawn into the trap as were also the large sabre-toothed tigers which then roamed that vicinity. Today scientists are engaged in excavating the bones deposited there by indiscreet appetite.

The aim of civilization is to create inhibition, the quality which holds back and directs to useful purposes the natural appetites, preventing them from leading man into the pitfalls which beset over-indulgence. Hunger is the great stimulus of action, but when it is satisfied to satiety, sodden inactivity follows. If the natural appetite is allowed to dominate it leads to over-indulgence, and the unwary victim suddenly finds himself in a trap from which he cannot escape.

One of the great elements in maintaining health is the regulation of the bodily intake to meet the appetite. The man who works with his hands requires more food than the brain worker. The man who labors in the open air needs more nourishment than he who sits cooped in an office all day long. Give the sedentary worker the appetite of the day laborer and if that appetite be uncontrolled the body will become clogged with the poisonous products of its own manufacture, and physical deterioration will surely follow. It is just as bad to eat too much as it is to eat too little. To indulge the appetite to too great an extent is equally as pernicious as its constant repression. The best is to be found in an average course, neither over- nor under-indulgence, neither the following of the inelastic dietary nor the promiscuous and ill-considered use of foods. Many a so-called case of dyspepsia is nothing in the world but the rebellion of an overworked stomach, the remonstrance of a body which has been stuffed to repletion. A great deal has been accomplished in the reduction of infant mortality because we are able to control what infants may eat. Adults must for themselves exercise this as self-control. If this is done there will be a decline in our adult mortality rates and an increase in health and efficiency.

RECENT DEATHS.

Brooks Hughes Wells, M.D., of New York City, died at the home of his sister in Southport, Conn. on July 6 of injuries received in being thrown from a bicycle. Dr. Wells was a captain in the Medical Reserve Corps and was well and favorably known as a surgeon. He was connected with various New York hospitals, including the Polyclinic. He was born in New Haven, Conn., in 1859. He is survived by his widow and four daughters.

MARRIAGES.

The marriage is announced of Miss Marguerite Mayberry of Pittsfield, Mass., and Dr. William Franklin Temple, Jr., of Boston. Dr. Temple graduated from the Harvard Medical School in 1911

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SOME MEDICAL PRACTICE AMONG THE NEW ENGLAND INDIANS AND EARLY SETTLERS.

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So far as I know we have no accurate observation and record of medical practice among the New England Indians, especially such as existed prior to their contact with the early settlers. There were good reasons for this: the early settlers were too busy trying to get a living, there were no trained scientific observers among them; medical practice even in England was almost wholly empirical at that time. The Pilgrims and Puritans were particularly free from incantations and the rites of magic in their medical practice for the reason that they had broken away from all those who would be led to attach importance to such agencies, although they had an abiding belief in a personal devil and in witches. Their medicine was the folk medicine of tradition and personal experience, consisting as it did largely of roots and herbs. It is very hard to tell, many times, how much they learned from the Indians and how much the Indians learned from them. We have two early books written about New England from which some idea of Indian medicine may be gained, Wood and Josselyn. Wood was a sort of press agent for New England and the reference to medical matters is only incidental, but Josselyn was a good deal of a naturalist and something of a physician.

Before giving an account of the medical practice of the New England Indians it seems necessary to say just a word in regard to medical superstition among them. Payne remarks that "The belief that internal maladies due to no visible cause are the work of evil spirits is traceable in the earliest records of ancient medicine which we possess, and is found among uncivilized races in most parts of the world, as the accounts of travelers and investigators clearly prove. It is evident that we have here one of the most fundamental, perhaps the most universal conception of the origin of internal disease." This is a true picture of the New England Indian. He believed in evil spirits and did things to drive them away, but he had never been contaminated by Eastern magic, neither did he use the elaborate methods employed, in later times at any rate, among the Indians of the West. Wood describes their Pow Wow. He says they worship Ketan who is their good God, to him "they invocate for fair weather, for rain in time of drought, and for the recovery of their sick." After giving some of the tricks of which, he says, the Indians told him, he goes on to give an account of a Pow Wow. "An honest Gentleman related a story to me, being an eye witness of the same: A Pow Wow having a patient with the stump of some small tree run through his foot, being past the cure of his ordinary surgery, betook himself to his charmes, and being willing to show his miracles before the English stranger, he wrapt a piece of cloth about the foot of the lame man; upon that wrapping a Beaver skin, through which he laying his mouth to the Beaver skin, by his sucking charmes he brought out the stump, which he spat into a tray of water, returning the foot as whole as its fellow in a short time. The manner of their action in their conjuration is thus: The parties that are sick or lame being brought before them, the Pow Wow sitting down, the rest of the Indians giving attentive audience to his imprecations and invocations, and after the violent expression of many a hideous bellowing and groaning, he makes a stop, and then all the auditors with one voice utter a short Canto; which done, the Pow Wow still proceeds in his invocations, sometimes roaring like a Bear, other times groaning like a dying horse, foaming at the mouth like a chased bore, smiting on his naked breast and thighs with such violence, as if he were mad. Thus will he continue sometimes half a day, spending his lungs, sweating out his fat, and tormenting his body in this diabolical worship; sometimes the Devil for requital of their worship, recovers the party, to nuzzle them up in their devilish religion. In former time he was wont to carry away their wives and children, because he would drive them to these Mattens, to fetch them again to confirm their belief of this his much desired authority over them: but since the English frequented those parts, they daily fall from his colorus, relinquishing their former fopperies, and acknowledge our God to be supreme. They acknowledge the power of the Englishman's God, as they call him, because they could never yet have power by their conjurations to damnify the English either in body or goods; and besides, they say he is a good God that sends them so many things—so much good corn, so many cattle, temperate rains, fair seasons, which they likewise are the better for since the arrival of the English; the times and seasons being much altered in seven or eight years, free from lightning and thunder, long droughts, sudden and tempestuous dashes of rain, and lamentable cold winters."—"New England Prospect." Wood wrote this in 1633. Both Wood and Josselyn consider the country healthful. Wood especially took a very optimistic view. The climate seemed to impress him favorably in comparison with that of England, as did also the abundance of food. He explains the death rate among the new arrivals and claims it was not due to the climate. "It is observed by the Indians that every tenth year there is little or no winter, which hath been twice observed of the English; the year of the new Plymouth men's arrival was no Winter in comparison; and in the tenth year after likewise when the great company settled themselves in Massachusetts Bay, was a very mild season, little frost, and less snow, but clear serene weather, few North-West winds, which was a great mercy to the English coming over so rawly and uncomfortably provided, wanting all utensils and provisions, which belonged to the well being of planters: and whereas many died at the beginning of plantations, it was not because the country was unhealthfull, but because their bodies were corrupted with sea-diet, which was naught, their Beef and Pork being tainted, their Butter and Cheese corrupted, their Fish rotten, and voyage long, by reason of cross Winds, so that winter approaching before they could get warm houses, and the searching sharpness of that purer climate, creping in at the crannies of their crazed bodies, caused death and sickness; but their harms having taught future voyagers more wisdom, in shipping good provision for sea, and finding warm houses at landing." He seems to consider New England a health resort. "In New England both men and women keep their natural complexion; and as it is for the outward complexion, so it is for the inward constitution; not very many being troubled with inflammations, or such diseases as are increased by too much heat: and whereas I say, not very many, yet dare I not exclude any; for death being certain to all, in all nations there must be something tending to death of like certainty. The soundest bodies are mortal and subject to change, therefore fall into diseases, and from diseases to death. Now the two chief messengers of mortality, be feavers and Callentures; but they be easily helped, if taken in time, and as easily prevented of any that will not prove a mere fool of his body. For the common diseases of England, they be strangers to the English now in that strange land. To my knowledge I never knew any who had the Pox, Measels, Green-sickness, Head-aches, Stone, or Consumptions, etc. Many that have come infirm out of England, retain their old grievances still, and some that were long troubled with lingering diseases, as Coughs of the lungs, Consumption, etc., have been restored by that medicineable Climate to their former strength and health."

All through the early writings about New England we find the question of drinking water taken very seriously. It was one of the doubts about making a success of the undertaking. The people came very naturally to view the subject in this light, for they had drunk beer for many centuries in England. Rogers says that during the thirteenth, fourteenth, fifteenth, and sixteenth centuries fully one third of the cost of maintaining the family was for malt. Probably the lack of sugar had something to do with this use of malt. The Pilgrims began to experiment with water drinking soon after they reached Plymouth. Bradford says: "Monday, the 25th, being Christmas day, we began to drink water abroad. But at night the master caused us to have some beer; and so on board we had divers times now and then some beer, but on shore none at all." Wood, writing thirteen years after, thinks the water good but is a little doubtful about drinking it himself, and says "he dare not prefer it before good beer." For the country it is as well watered as any land under the Sun, every family, or every two families, having a spring of sweet waters betwixt them, which is far different from the waters of England, being not so sharp, but of a fatter substance, and of a more jetty color (sparkling), it is thought there be no better water in the world, yet dare I not prefer it before good Beer, as some have done, but any man will choose it before bad Beer, Whey, or Buttermilk. Those that drink it be as healthful, fresh, and lusty, as they that drink beer." Both Wood and Josselyn seem quite taken with the physical perfections of the Indians.

"First of their Stature, most of them being between five or six foot high, straight bodied, strongly composed, smooth skinned, merry countenanced, of complexion something more swarthy than Spaniards, black haired, high foreheaded, black eyed, out-nosed, broad shouldered, brawny armed, long and slender handed, out breasted, small waisted, lank bellied, well thighed, flat kneed, handsome grown legs, and small feet: In a word, take them when the blood brisks in their veines, when the flesh is on their backs, and marrow in their bones, when they frolick in their antique deportments and Indian postures; and they are more amiable to behold (though only in Adams Livery) than many a compounded phantastick in the newest fashion. It may puzzle belief, to conceive how such lustie bodies should have their rise and daily supportment from so slender a fostering; their houses being mean, their lodging as homely, commons scant, their drink water and Nature their best clothing, in them the old proverb may well be verified: (Natura paucis contenta) for though this be their daily portion, they still are healthful and lusty. I have been in many places yet did I never see one that was born either in redundance or defect a monster, or any that sickness had deformed, or casualitie made decrepit, saving one that had a bleared eye, and another that had a wenne on his cheek. The reason is rendered why they grow so proportionable, and continue so long in their vigor (most of them being 50 before a wrinkled brow or gray hair bewray their age, is because they are not brought down with suppressing labor, vexed with annoying cares, or drowned in the excessive abuse of overflowing plenty, which oftentimes kills them more than want, as may appear in them. For when they change their bare Indian commons for the plenty of England's fuller diet, it is so contrary to their stomachs, that death of a desperate sickness immediately accrews, which makes so few of them desirous to see England. Their swarthiness is the sun's livery, for they are born fair. Their smooth skins proceed from the often annointing of their bodies with the oil of fishes, and the fat of Eagles, with the grease of Rackoones, which they hold in summer, the best antidote to keep their skins from blistering with the scorching Sun, and it is their best armour against the Musketoes, and the surest expeller of the hairy excrement, and stops the pores of their bodies against the nipping winters cold. . . If their fancy drive them to trade, they choose rather a good coarse blanket, through which they cannot see, interposing it between the sun and them; or a piece of broad cloth, which they use for a double end, making it a coat by day, and a covering by night; they love not to be imprisoned in our English fashion: they love their own dog-fashion better (of shaking their ears, and being ready in a moment) than to spend time in dressing them, though they may as well spare it as any man I know, having little else to do. But the chief reasons they render why they will not conform to our English apparel, are, because their women cannot wash them when they be soiled, and their means will not reach to buy new when they have done with their old; and they confidently believe, the English will not be so liberal as to furnish them upon gifture: therefore they had rather go naked than be lousie, and bring their bodies out of their old tune, making them more tender by a new acquired habit, which poverty would constrain them to leave." (Wood's "New England Prospect.")

Josselyn was particularly struck with the Indian women.

THE INDIAN.

"The Men are somewhat Horse Faced, and generally Faucious, that is, without beards, but the women many of them have very good features, seldome without a Come to me, or Cos Amoris, in their Countenance, all of them black eyed, having even short teeth, and very white, their hair black, thick and long, broad breasted, handsome straight bodies, and slender, considering their constant loose habit. Their limbs cleanly, straight, and of a convenient stature, generally, as plump as Partridges and saving here and there one, of a modest deportment.

"Their Garments are a pair of sleeves of deer, or Moose skin drest, and drawn with lines of several colours into Asiatick Works, with Boskins of the same, and short Mantle of Trading Cloth, either Blew or Red, fastened with a knot under the chin, and girt about the middle with a Zone wrought with white and blew Beads into pretty Works; of these Beads they have Bracelets for their Neck and Arms, and Links to hang in their Ears, and a fair Table curiously made up with Beads likewise, to wear before their breast, their Hair they comb backward, and tie it up short with a Border, about two handfulls broad, wrought in Works as the other with their Beads." ("New England Rarities.")

Wood goes fully into their diet, and from his description one gathers the impression that it was turkey one day and feathers the next. "Some of their scullerie having dressed these homely cates, presents it to his guests, dishing it up in a rude manner, placing it on the verdent carpet of the earth which Nature spreads them, without either trenchers, napkins, or knives, upon which their hunger-fawced stomacks impatient of delayes, falls aboard without scrupling at unwashed hands, without bread, salt, or beer, lolling in the Turkish fashion, not ceasing till their full bellies leave nothing but empty platters: they seldom or never make bread of their Indian corn, but seeth it whole like beans, eating three or four cornes with a mouthful of fish or flesh, sometimes eating meat first, and corns after, filling in chinkes with their broth. In summer, when their corn is spent, Isquoutersquashes is their best bread, a fruit like a young Pumpion. To say and to speak paradoxically, they be great eaters, and yet little meat men; when they visit our English, being invited to eat, they are very moderate, whether it be to show their manners, or for shamefastness, I know not; but at home they will eat till their bellies stand forth, ready to split with fullness; it being their fashion to eat all at some times, and nothing at all in two or three days, wise Providence being a stranger to their wilder ways: they be right infidels, neither caring for the morrow, or providing for their own families; but as all are fellows at foot-ball, so they all meet friends at the kettle, saving their wives, that dance a Spaniel-like attendance at their backs for their bony fragments. If their imperious occasions cause them to travel, the best of their victuals for their journey is Nocake (as they call it), which is nothing but Indian corn parched in the hot ashes; the ashes being sifted from it, it is afterward beaten to powder, and put into a long leathern bag, trussed at their back like a knapsack; out of which they take thrice three spoonefulls a day, dividing it into three meals. If it be in Winter, and Snow be on the ground, they can eat when they please, stopping Snow after their dusty victuals, which otherwise would feed them little better than a Tiburne halter. In Summer they must stay till they meet with a Spring or Brook, where they may have water to prevent the imminent danger of choaking. With this strange viaticum they will travel four or five days together, with loads fitter for Elephants than men.''

Wood mentions the pestilence which carried off many Indians just previous to the landing of the Pilgrims. He still acts the press agent and claims that the Indians were a particularly healthy race. To quote again from the New England Prospect, ''Although the Indians be of lusty and healthful bodies, not experimentally knowing the Catalogue of those health-wasting diseases which are incident to other countries, as Fevers, Pleurisies, Callentures, Agues, Obstructions, Consumption, Subfumigations, Convulsions, Apoplexies, Dropsies, Gouts, Stones, Toothaches, Pox, Measels, or the like, but spinne out the thread of their days to a fair length, numbering three-score, four-score, some a hundred years, before the worlds universal summoner cite them to the craving Grave.''

All the English who came in contact with sick Indians were impressed with their ceremonies to drive away the devil. Winslow went to Gardner's Neck in Swanzy to visit Massassowat and found him very sick; he says, ''When we came thither, we found the house so full of men, as we could scarce get in, though they used their best diligence to make way for us. There were they in the midst of their charms for him, making such a hellish noise, as it distempered us that were all well, and therefore unlike to ease him that was sick. About him were six or eight women, who chafed his arms, legs, and thighs, to keep heat in him.'' Winslow gave him some conserve which he had brought, and cleaned his mouth and tongue, and Massassowat began to improve. They did not appear to know anything of sick nursing or sick diet. Roger Williams says of them, ''When they are sick, their misery appears, that they have not but what sometimes they get from the English, a raisin or currant, or any physic, fruit, or spice, or any comfort more than their corn and water. In which bleeding case, wanting all means of recovery or present refreshing, I have been constrained, to and beyond my power, to refresh them, and to save many of them from death, who I am confident perish many millions of them, in that mighty continent, for want of means.''

My impression is that for slight ailments, and for wounds and bruises they used medicine so far as their limited knowledge and limited resources went, but if a patient became very sick they lost confidence in medicine and resorted to the superstitious practices which are common to all people of their grade of intelligence, i. e., they tried to drive away the devil by making noise enough so that he would prefer a quieter place. This may have had a hypnotic effect upon the patient even if it did not upon the devil.

From these quotations we get the impression that the use of remedies by the Indians was extremely limited; in fact, Wood mentions but one herb which was so used, snake weed for snake bite; and Mourt's relation mentions the use of medicines but does not go into details. As a matter of fact they did use quite a number of remedies and with quite as much sense as the settlers used theirs. We are indebted to John Josselyn for a description of many of their methods of treating diseases and wounds.

John Josselyn made two voyages to New England, the first in 1638, arriving in Boston harbor July 3d, and remaining with his brother at Black Point in the town of Scarborough, Me., till October 10 of the following year. His second voyage was made in 1663. He arrived at Nantasket the 27th of July, and soon proceeded to his brother's plantation, where he tells us he staid eight years, and got together the matter for his book.

The book was not intended for a treatise on medicine but rather as a work on natural history. For this reason there is no arrangement of diseases and remedies, but he puts down anything he has learned of medical practice when he describes the bird, beast, or plant which is attracting his attention at the time. Occasionally he gives a remarkable cure of which he has heard, but generally he confines himself to what he has seen. He says he has seen pond frogs a foot high, and that the Indians told him that back in the country there were frogs as large as a child a year old. Either the story, or the frog, seems pretty large, but Josselyn makes no comment. One curious fact is that he does not mention the Pow Wow or any medicine man among the Indians in "New England Rarities," but does mention them in his Voyages, but he describes what the common people did for their ailments.

I have gone through his books, "New England Rarities" and Voyages very carefully and have tried to arrange the diseases which he mentions and remedies which he says were used. So far as possible I have let him tell his own story.

Josselyn does not take so rosy a view of the New England climate as does Wood; he says, "The Sea Coasts are accounted wholsomest, the East and South Winds coming from the sea produceth warm weather, the Northwest coming over land causeth extremity of Cold, and many times strikes the Inhabitants, both English and Indian, with that sad Disease called there the Plague of the back, but with us Empiema." He evidently found more disease in New England than did Wood and the list as he gives it is what one would expect to find.

"THE MOST COMMON DISEASES IN NEW ENGLAND."

"The Black Pox, the Spotted Fever, the Griping of the Guts, the Dropsie, and Sciatica are the killing Diseases of New England." ("New England Rarities.")

"In New England the Indians are afflicted with pestilent Fevers, Plague Black-pox, Consumption of the Lungs, Falling-sickness, Kings-evil, and Disease called by the Spaniard the Plague in the back, with us Empyema, their physicians are the Powaws, or Indian Priests who cure sometimes by charms and medicine, but in a general infection they seldom come amongst them, therefore they use their own remedies, which is sweating, etc. Their manner is when they have plague or small pox amongst them to cover their Wigwams with Bark so close that no Air can enter in, lining them (as I said before) within, and making a great fire they remain there in a stewing heat till they are in a top sweat, and then run out into the Sea or River, and presently after they are come into their Hutts again they either recover or give up the Ghost." (Josselyn's Voyages.) Josselyn's "Spotted Fever" and Wood's "Callentures" were undoubtedly typhus fever.

People living under primitive conditions are very liable to accidents and we find a full list of remedies to be used in such emergencies.

"WOUNDS."

Cod Fish.—"About their Fins you may find a kind of Lowse, which healeth a green cut in a short time."

White Hellebore.—"The Indians cure their wounds with it, annointing the wound first with Raccoon grease, or Wild Cat grease, and then strewing upon it the powder of the Roots."

Alder.—"An Indian Bruising and cutting of his knee with a fall, used no other remedy, than Alder Bark, chewed fasting and laid to it, which did soon heal it. For wounds and cuts make a strong decoction of Bark of Alder, pour it into the wound, and drink thereof."

Birch.—"White and black, the bark of the birch is used by the Indians, for bruised wounds and cuts, boiled very tender and stampt between two stones to a plaster, and the decoction thereof, poured into the wound."

Board Pine.—"It yields a very soverign Turpentine for curing of desperate wounds. The Indians make use of the moss boiled in Spring Water, for Stabbs, pouring in the liquor, and applying the boiled moss well stamped or beaten between two stones."

"An Indian, whose knee was bruised with a fall, and the skin and flesh striped down to the middle of the Calf of his Leg cured himself with Water Lilly Roots boiled and stamped."

"Winter Green, the leaves are excellent Wound Herbs."

"Clounes all heal, of New England, is another wound Herb not Inferior to ours, but rather beyond it."

The Larch Tree.—"The leaves and gum are both very good to heal wounds and cuts. I once cured a desperate bruise with a cut upon the knee-pan with an Unguent made with the Leaves of the Larch Tree, and Hogs Grease, but the gum is best."

Proud Flesh.—"To eat out proud flesh, they take a kind of earth Nut boiled and stamped and last of all, they apply to the sore the roots of water lilies boiled and stamped between two stones to a plaster."

INJURIES, BRUISES, SPRAINS.

"The Rattle Snake, they have leafs of Fat in their bellies, which is excellent to annoint frozen limbs, and for Aches and Bruises wondrous soveraign."

"An Indian whose thumb was swelled, and very much inflamed, and full of pain increasing and creeping along to the wrist, with little black spots under the thumb, against the nail, I cured it with this Umbellicus Veneris Root and all, the yolk of an egg, and wheat flour."

"The root of the Humming Bird Tree, the Indians make use of it for aches, being bruised between two stones, and laid to cold, but made (after the English manner) into an unguent with Hogs Greese, there is not a more soveraign remedy for bruises for what kind soever, and for Aches upon the Stroaks.”

“The Raccoon, their Fat is excellent for bruises and Aches.”

“Blew Flower-de-luce.—For Bruises of the Feet and Face.”

“Sperma Ceti Oil.—Is admirable for Bruises and Aches.”

“Sassafras.—The leaves of the same Tree are very good made into an ointment for bruises and dry blows.”

BURNS AND SCALDS.

“Seal Oil.—It is very good for Scalds and Burns.”

Pond Frogs.—“They are of a glistening brass colour and very fat, which is excellent for Burns and Scaldings, to take out the Fire, and heal them, leaving no scar.”

Decoction of Alder Bark.—“Is also excellent to take fire out of a Burn or Scald.”

“Birch Bark.—Boiled very tender and stamped between two stones to a plaister, and a decoction thereof—to take the fire out of burns and scalds.”

“Tobacco.—There is not much of it planted in New England, the Indians make use of a small kind with short round leaves called Pooke. With a strong decoction of tobacco, they cure Burns and Scalds, boiling it in water, from a Quart to a Pint, then wash the sore therewith, and strew on the powder of dried tobacco.”

“The New England Daisy, or Primrose, is very good for Burns and Scalds.”

“And for Burning and Scalding, they first take out the fire with a strong decoction of Alder Bark, then they lay upon it a plaster of the Board Pine (bark) first boiled tender, then beaten to a plaster between two stones. One Christopher Luxe, a fisherman, having burnt his knee pan, was healed again by an Indian Webb, or wife, for so they call those women who have husbands. She first made a strong decoction of Alder Bark with which she took out the fire, by Imbrocation, or letting of it drop upon the sore, which would smoke notably with it, then she plastered it with the Bark of Board Pine, or Hemlock Tree, boiled soft and stamped between two stones, till it was as thin as brown paper, and of the same colour. She annointed the plaster with Soyles Oil, (Seal oil) and the Sore likewise, then she laid it on warm, and sometimes she made use of the bark of the Larch Tree.”

“Water Plantane.—Called here Water suck-leaves. It is much used for Burns and Scalds.

INFLAMMATION.

“Fat of the pond frog.—Very good to take away any inflammation.”

“Wood-bine.—Good for hot swelling of the legs, fomenting with the decoction, and applying the Feces in the form of a Cataplasme.”

“An Indian Webb, her Foot being very much swelled and inflamed, asswaged the swelling, and took away the inflammation with our Garden or English Patience, the Roots roasted.”

ABSCESS.

“Indian Wheat (wild rice).—It is hotter than our wheat and clammy, excellent in Cataplasms to ripen any swelling or impostume.”

“The Indians break and heal their Swellings and Sores with it, boiling the inner Bark of young Hemlock very well, then knocking it between two stones to a plaster and annointing, or soaking it in Soyls Oil, they apply it to the Sore, it will break a Sore Swelling Speedily.”

Josselyn mentions two cases of cancer which were cured: the first is an example in an English woman of the arsenic treatment; it also contains a curious little touch showing where prohibition Maine got its beer even in those days.

“I shall conclude this Section with a strange Cure effected upon a Drummer's Wife, much afflicted with a Wold in her Breast; the poor Woman lived with her Husband at a Town called by the Indians, Casco, but by the English, Famouth; where for some time she swaged the Pain of her Sore by bathing it with strong Malt Beer, which it would suck in greedily, as if some living Creature: (for it was brought from Boston, along the Coasts by Merchants.) she made use of Rhum, a strong Water drawn from Sugar Canes, with which it was lull'd asleep, at last, (to be rid of it altogether) she put a quantity of Arsnick to the Rhum, and bathing of it as formerly, she utterly destroyed it, and Cured herself; but her kind Husband, who sucked out the Poison as the Sore was healing, lost all his Teeth, but without further danger or inconvenience.”

In the description of the next case it is very hard to tell just what disease he meant. Bailey's definition of scirrhus is “A hard immovable Swelling that resists the Touch, and is without Pain.”

“An Indian dissolved a Scirrhous Tumour in the arm and hip, with a fomentation of Tobacco, applying afterwards the Herb stamped between two stones.”

BRONCHITIS—SHORTNESS OF WIND—COLDS.

“Oak of Cappadocia, both much of a nature, but Oak of Hierusalem is stronger in operation, excellent for stuffing of the lungs upon colds, shortness of Wind, and Ptisick, maladies that the natives are often troubled with: I helped several of the Indians with a drink made of two Gallons of Molasses wort, (for in that part of the country where I abode we made our beer of Molasses, Water, Bran, chips of Sassafras Root, and a little Wormwood well boiled), into which I put of Oak of Hierusalem, Catmint, Sowthistle, of each one handful, of Enula Campana Root one Ounce, Liquorice scraped bruised and cut in pieces, one Ounce, Sassafras Root cut in thin chips, one Ounce, Anny-seed and sweet Fennel seed, of each one Spoonful bruised; boil these in a close Pot, upon a soft Fire to the Consumption of one Gallon, then take it off, and strein it gently, you may if you will boil the streined liquor with Sugar to a Syrup, then when it is Cold, put it in Glass Bottles, and take thereof three or four spoonfuls at a time, letting it run down your throat as leasurely as possible you can; do thus in the Morning, in the Afternoon, and at Night going to Bed."

Sumach, "The English used to Boil it and drink it for a cold, and so do the Indians, from whom the English had the Medicine."

PLAGUE OF THE BACK.

"The Firr Tree, or Pitch Tree, the tar is made of all sorts of pitch wood is an excellent thing to take away those desperate Stitches of the Sides, which perpetually afflicteth those poor people that are stricken with the Plague of the Back." Note.—"You must make a toast, or Cake, slit and dipt in the Tar, and bind it warm to the side."

CONSUMPTION.

"The Land Turtle, they are good for Physick and Consumptions, and some say the Morbus Callicus." (Syphilis.)

They seem to have had fewer remedies for fevers than their frequency and importance would seem to warrant. The use of a decoction of black birch bark for chills was, of course, an accidental discovery of the effect of salicylic acid. They undoubtedly used it much as we do aspirin.

FEVERS.

"Water-Mellon, it is often given to those sick of Fevers, and other hot diseases with good success."

"Bill Berries, two kinds, Black and sky coloured, which is more frequent. They are very good to allay the burning heat of fevers, and hot Agues, either in syrup or conserve."

Agues.—Black birch for chills. The Indians are said to have used a decoction of black birch bark for chills. (Tradition.)

"Ravens-Claw is admirable for Agues."

"Sassafras, or Ague Tree, the Root boiled in Beer is excellent to allay the hot rage of Fevers, being drunk."

By aches Josselyn evidently means acute and chronic rheumatism. Here are his remedies.

ACHES.

"The Wobble, For aches, our way, for they are soveraign for aches, is to make mummies of them, that is, to salt them well, and dry them in an earthern pot well glazed in an oven; or else, which is the better way, to burn them under ground for a day or two, then quarter them and stew them in a stew-pan with a very little water."

"The Bear, their grease is very good for Aches and Cold Swellings, the Indians annoint themselves therewith from top to toe, which hardens them against the cold weather." "One Edward Andrews being Foxt, that is drunk, and falling backward across a Thought (Thwart) in a Shallop, or Fisher-boat and taking cold upon it, grew crooked, lame, and full of pain, was cured, lying one winter upon Bears Skins newly flead off, with some upon him, so that he sweat every night.

"A black Wolf's skin is worth a Beaver Skin among the Indians, being highly esteemed for helping old aches in old People, worn as a Coat."

"The Ounce, a wild cat, their grease is soveraign for all manner of Aches and shrunk Sinews."

White Hellebore.—"For Aches they scarify the grieved part, and annoint it with one of the foresaid Oils, (Raccoon or Wild Cat grease) then strew upon it the powder."

Dropsy was one of the deadly diseases which he mentions, but the remedies are very few, as they are today.

DROPSY.

Water Plantane.—"To draw water out of swelled Legs."

"Stone.—Likewise there is a stone found in their bellies (Cod fish) in a bladder against their navel, which being pulverized and drank in White-wine Posset or Ale, is a present Remedy for stone."

"Manaty.—There is a stone taken out of the head that is rare for the Stone and Collect. Their bones beat to a Powder and drank with convenient liquors, is a gallant Urin Provoking Medicine."

Scurvy was one of the most common diseases with the early settlers; it was one of the causes of the great sickness among the Pilgrims during the first winter. They knew that lemons and limes were good for the disease but they did not grow here and so they sought for other remedies, and the following are what they found.

SCURVY.

"Sea-tears, they grow upon the sea banks in abundance, they are good for Scurvy and Dropsie."

"The tops of Green Spruce Boughs boiled in Beer, and drunk, is assuredly one of the best Remedies for the Scurvy, restoring the Infected party in a short time."

"Cran Berry.—they are excellent against the scurvy."

Wood says that the danger of snake bite was not very great, and that he never heard of but one man who lost his life in this way, still it was an ever-present fear to the settlers. The remedies were few but heroic.

SNAKE BITE.

"When any man is bitten by any of these creatures, the poison spreads so suddenly through the veines and so runs to the heart, that in one hour it causeth death, unless he hath the Antodote to expell the poison, which is a root called snakeweed, which much be champed, the spittle swallowed, and the root applyed to the sore; this is present cure against that which would be present death without it: this weed is ranck poison, if it be taken by any man that is not bitted: whosoever is bitte by these snakes his flesh becomes as spotted as a Leaper until he be perfectly cured. It is reported that if the party live that is bitten, the snake will die, and if the party die, the snake will live." (Wood's "New England Prospect.")

"The Rattle Snake.—Their hearts swallowed fresh, is a good Antidote against their Venome, and their liver, the Gall taken out, bruised and applied to their Bitings is a present Remedy." ("New England Rarities.")

"Wind in the Stomach.—The skin of the Gripe drest with the doun on, is good to wear upon the stomach for the pain and coldness of it."

"The Beaver, their solid Cods are much used in Physick: Our English women in this Country use the powder grated, as much as will lie upon a shilling in a draught of Fiol Wine, for wind in the Stomach and Belly, and venture many times in such cases to give it to Women with Child."

Teething necklace.—"The Indian Webbes make use of the broad teeth of the Fauns (Moose) to hang about their children's necks when they are breeding their Teeth. The tongue of a grown Moose, dried in the smoke after the Indian manner, is a dish for a Sagamore."

Menorrhagia.—"The Codfish, in the head of this fish is found a Stone, or rather a bone which being Pulverized and drank in any convenient liquor, will stop Women's overflowing Courses notably."

Codfish.—"Their livers and Sounds eaten is a good Medicine for to restore them that have melted their Grease."

Emetics.—"Blew Flower-de-luce; it is excellent to provoke Vomiting."

Love philtre.—"Dogstones, a kind of Satyrion, whereof there are several kinds groweth in our salt Marshes. I once took notice of a wanton Woman compounding the Solid Roots of this Plant with wine, for an Amorous Cup, which wrought the desired effect."

Film of the eyes.—"The Sheath Fish, which shell Calcined and Pulverized, is excellent to take off a Pin and Web, or any kind of Filme growing over the Eye."

Piles.—"Morse, or Sea Horse, having a great head, a wide jaw, armed with Tushes as white as Ivory, a body as big as a cow, proportioned like a Hog, of brownish bay, smooth skinned and impenetrable, they are frequent at the Isle of Sables, their teeth are worth eight Groats the Pound, the best Ivory being sold but for half the money. It is very good against Poison. As also for Cramp, made into rings. And a secret for the Piles, if a wise man have the ordering of it."

SCURVY SORES.

"Coals of Birch pulverized and wrought with the white of an egg to a salve, is a gallant remedy for dry scurfy sores upon the shins, and for bruised wounds and cuts."

SCIATICA.

"Spunck, an excrescence growing out of Black Birch, the Indians use it for Touchwood, and therewith they help the Sciatica, or Gout or the Hips, upon the Thigh, and upon certain Veins."

HERPES MILIARIS.

White Hellebore.—"The Root sliced thin and boiled in Vinegar, is very good against Herpes Miliaris."

SORE MOUTH AND FALLING OF THE PALATE.

"The decoction of blew corn is good to wash sore mouths with.

"Hasel, for sore mouths, falling of the Pallat."

Filberd.—"Both with hairy husks upon the nuts, and setting hollow from the nut, and filled with a kind of water, of an astringent taste, it is very good for sore mouths, and falling of the Pallat, as is the whole green nut, before it comes to Kernel, burnt and pulverized."

SCALLED HEAD.

"Of the Moss that grows at the roots of the White Oak the Indians make a strong decoction, with which they help their Papouses or young Children's scalled Heads."

TO KEEP THE FEET WARM.

"Bastard Calamus Aromaticus, the English make use of the leaves, to keep their feet warm."

MOTHER FITS.

Seal oil.—"Some of it, being cast upon Coals, will bring Women out of the Mother Fits." (Hysteria, Eclampsia?)

TOOTHACHE.

"The Osprey, their beaks excell for the toothache, picking the Gums therewith until they bleed."

"The dogfish, upon whose Back grows a

Thorn two or three Inches long, that helps the Toothache, scarifying the Gums therewith.''

''Hellibore.—The powder of the Root put into a hollow tooth, is good for the Tooth-ache.''

EARACHE.

Oil of the red fox.—''Their fat liquified and put into ears easeth pain.''—Josselyn's Voyages.

FALLING SICKNESS.

''The Indians tell of a tree that growes far up in the land, that is as big as an Oake, that will cure the falling-sickness infallibly, what part thereof they use, Bark, Wood, or fruit, I could never learn; thay promised often to bring of it to me, but did not.''—Josselyn's Voyages.

INDIAN TURKISH BATH.

''This Hot-house is a kind of little Cell or Cave, six or eight foot over, round, made on the side of a hill (commonly by some Rivulet or Brooke) into this frequently the Men enter after they have exceedingly heated it with store of wood, laid upon an heape of stones in the middle. When they have taken out the fire, the stones keepe still a great heat: Ten, twelve, twenty more or less, enter at once starke naked, leaving their Coats, small breeches, (or aprons) at the doore, with one to keepe all: here doe they sit round these hot stones an houre or more, taking tobacco, discoursing and sweating together; which sweating they use for two ends: First, to cleanse their skin: Secondly, to purge their bodies which doubtless is a great meanes of preserving them, and recovering them from diseases, especially from the French disease, which by sweating and some potions, they perfectly and speedily cure: when they come forth (which is matter of admiration) I have seen them runne (Summer and Winter) into the brookes to coole them, without the least hurt.'' —Roger Williams' Key to the Indian language.

This seems to be a description of a primitive but effectual Turkish bath. This was used, evidently, as a general hygienic measure and not for the treatment of the serious diseases such as Josselyn describes.

DISEASES COMMON TO THE ENGLISH.

''The Diseases that the Engish are afflicted with, are the same that they have in England, with some proper to New England, griping of the belly (accompanied with Feaver and Ague) which turns to the bloody-flux, a common disease in the Countrey, which together with the small pox hath carried away abundance of their children.''

''Also they are troubled with a disease in the mouth or throat which hath proved mortal to some in a very short time,* Quinsies, and Impostumations of the Almonds, with great distempers of cold.''—Josselyn's Voyages.

The Indians were great users of oil, both as an article of diet, and to anoint their bodies. They used any kind of oil they could get, rattlesnake oil, eagle oil, seal oil, raccoon and bear's grease, and they had an elaborate method of obtaining oil from white oak acorns.

The remedies used by the New England Indians were entirely different from those used by the Western and Southern Indians, i. e., each used the plants which were native to their locality. The medicine used by the Indians and early English are of no use today, but the study of this primitive folk medicine is of interest, not alone from an historical point of view, but as showing the origin of many methods in use among the people as well.

BIOLOGIC ANALYSIS IN THE STUDY OF TRUE EPILEPSY.

By F. L. Dunham, M.D., Baltimore.

The derivation of the word ''epilepsy,'' from the Greek verb ''to seize upon,'' describes no less clearly the onset of the condition itself than it characterizes the whimsicalities frequently adopted by writers in discussing its etiology. It would be difficult to choose a symptom-complex about which have been woven more fantastic hypotheses than that of epilepsy, the ''Sacred Disease'' of the Asclepiadae, which Hippocrates characterized as no more sacred or mysterious than other ills whose nature appears to be above the level of human understanding. The tendency to justify an attitude of doubt respecting the cause of epilepsy has probably found encouragement in the superior endowment of many subjects of this disorder, who are reckoned among the world's geniuses. The more adequate adaptation to their social environment, secured in recent years to segregated groups of epileptics, has produced definite results in studying the causes and results of the disorder. At the same time the broader application of scientific method in experimentation has tended to dispel the unethical haze long surrounding the subject. Even the more recent psychoanalytical point of view, with its appeal to an obscure symbolism, has helped to develop a more thorough biologic analysis.

Whether true epilepsy is to be regarded as a simple neurosis, as a manifestation of organic disease with evidence of cerebral toxemia, or as an ''unconscious striving, with its insistent urge in the fits, to return to the maternal intrauterine life,'' analyses following biologic lines only are justified as a means toward the recognition of potential subjects. From this point of view, a logical procedure of investigation will follow out the hereditary factors revealed in family tendencies to instability, the course of embryonic development, the early reaction to primitive instincts, together with a complete review of the social behavior of the subject. Until the facts of such an analysis are secured no amount of pathological detail can render practical service in the disposition of individual cases.

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* Was this diphtheria?

Although most modern students of the subject agree with Hippocrates in ascribing true epilepsy to tendencies following the laws of heredity and recognize its stimuli as intimately connected with the brain, various cases, with no known intrinsic factors, indicate that some epileptics owe their condition to extrinsic or environmental causes. Current procedure, moreover, corresponds with that of Hippocratic times in attributing the most satisfactory therapeutic results to food and hygienic regulation, "without minding purifications, spells, and all other illiberal practices of a like kind."

Believing that satisfactory studies of the subject, especially such as deal with its relation to social adaptation, can result only from prolonged observation of segregated groups of epileptics, the writer presents the following data obtained from two groups of ten subjects each, inmates during several years of a modern colony-home in central New England. The children were unselected, save with reference to the frequency of definitely typical seizures. An attempt was also made to secure only those subjects who had shown no marked indication of mental inferiority in infancy. The data for analysis were secured from the following examinations:

1. An anthropological examination.
2. An intelligence test (point-scale) checked by a second (Binet-Simon) test.
3. A complete physical examination, including an examination of the urine.
4. A Wassermann reaction.
5. An examination of the social history of the family, so far as possible through personal solicitation, otherwise by questionnaire.

The subjects were also studied in their customary environment, now playing or working in groups, at other times alone with an attendant. An attempt was made to place each child at his ease by engaging him in some task, thus minimizing the changed emotional reaction incident to any examination, with its resulting inaccuracies.

That true epilepsy is often the result of defective development, whose beginnings are laid down in the egg, was suggested by the Father of Medicine in an Aphorism to the effect that "epilepsy begins to be formed while the fetus is *in utero*." This conception of its ultimate causation is amply justified by the usual pathological findings, *i.e.*, a typical arrangement of the convolutions and microgyria, generally without microscopic defect in structure except of a secondary nature. Moreover, it tends to harmonize various obscure psychic manifestations now frequently attributed to the vagaries of lower levels of consciousness, by recognizing in them the primitive, unconditional reflexes which, through morphologic defect in mechanism, have failed to reach biologic adjustment as exemplified in the conditional reflex. In general, it is true that defective forms of morphological development are due to alterations of the normal environmental stimuli rather than to defective hereditary constitution. Even though a tendency to the latter may be inherited, a normal environment may prevent their appearance. The differentiations of cleavage, which are the earliest expressions leading to the formation of cells qualitatively and quantitatively different, are from the first subjected to an extrinsic environment whose delicacy is inconceivable save through an appeal to the elaborate physicochemical reactions of the blood. The problem of development here presented seeks to determine, so far as possible, the origin and sequence of morphological differentiations, together with the extrinsic factors whose results are manifest in epilepsy. It is well recognized that the earlier stages in development are more easily influenced by environmental changes than are later ones. That these may result in profound departures from the normal adult structures, is clear when it is recalled that at this germinal period entire organic systems may be represented by a few cells merely. Almost all persistent alterations of embryonic structure occur during cleavage, and are due primarily to interference with the divisional apparatus of the cell. This seems to be explained by the fact that when chromosomes, centrosomes or differentiated portions of the cell-body are once distributed abnormally to the two daughter cells there is no possibility of bringing about a normal redistribution of these structures. Experiments with the eggs of lower animals indicate that various environmental changes cause abnormalities in the separation of daughter chromosomes and in their fusion to form daughter nuclei. Subjected to various abnormal stimuli such as pressure, electric currents, unusual thermal conditions, unnatural chemical solutions, changes are produced in the type of cleavage, in the orientation and structure of mitotic figures and induction of polyspermy, together with various abnormalities of the chromatin and chromosome content of the cells. It is generally held that the human ovum follows the same general course in development as the germ cells of lower animals. Setting aside, therefore, those cases of defect which may be traced to intrinsic or hereditary factors, clinical observations as well as experimental deductions would indicate that the extrinsic elements surrounding the human germ-cell in syphilitic or tuberculous mothers or those with abnormal physiological secretions are amply able to leave their imprint of potential defect upon the plastic structure of the embryo. Again, if it is held that the egg cytoplasm fixes the general type of development, while the sperm acts primarily in contributing details such as are exemplified by mental peculiarities, it is evident that the father's contribution to the fertilized germ-cell might also induce defect. Various studies have shown that environmental agents, such as alcohol, profoundly modify the germ-cells. "Thus the external as well as the internal factors are to be considered, not only in individual or embryonic development, but also in heredity. Experiments demonstrate for mammals that either the spermatozoön or the ovum may be experimentally injured or modified in such a manner as not only to give rise to abnormal development in the resulting embryo, but the effects of the injury may be transmitted from generation to generation, until an affected line actually fades out through degeneracy and sterility as a result of the transmitted condition." This tendency among students of genetics to give a broader interpretation to the influence of environment is well expressed by Morgan in his experimental studies on Drosophila: "If we measure or weigh or classify any character shown by the individuals of a population, we find differences. We recognize that some of these are due to the varied experiences that the individuals have encountered in the course of their lives, *i.e.*, to their environment, but we also recognize that some of the differences may be due to individuals having different germ plasms."

The various factors here reported show conclusively that the prenatal environment of each of these individuals was modified sufficiently to induce, in any organism, profound structural changes. The objection may be raised, however, that this offers no explanation of the specific defect. Why epilepsy instead of idiocy or a monster? To this one can only reply that the various objective results of the process seem to differ in degree only. All cerebral disturbances presuppose some specific defect of organization. Idiocy and epilepsy are frequently synonymous, and the epileptic has many physical stigmata which are the hall marks of the monster. It is of interest to note in this connection that recent investigation points to the conclusion that the primary causes underlying the origin of monsters in man and other mammals are autogenous chemical modifications of the parental blood. Working with butyric acid and acetone, Werber concludes that all morphological deformities of sensory organs may be induced through the blastolytic action of the modified environment.

In the absence of precise experimental data revealing the exact nature of the epileptic predisposition, a biologic analysis is able to present results of practical application from the standpoint of social adjustment. It is possible, for instance, to answer the questions, so vital to one seeking explanation of suspicious conduct, "How early is it possible to recognize traits indicative of ill-balance in a child?" Through what factors of behavior may latent epilepsy be anticipated? A partial answer, at least, is found in the data here presented.

Significant incidents of behavior as the child emerged from infancy are the following:

EARLY OBSERVATIONS OF INSTABILITY.

Case A. Frequent slight "worm-fits," tantrums, bed-wetting, somnambulism. Teeth, palate and ears stigmatic.
" B. Mentally retarded, somnambulism, speech defect. Ears stigmatic.
" C. Tantrums, bed-wetting, precocious day dreaming.
" D. Tantrums, somnambulism, bed-wetting, recurrent dreams.
" E. Tantrums, rolling out of bed during sleep, bed-wetting. Ears stigmatic.
" F. Early persistent masturbation, thumb-sucking, tantrums, always bumping head. Cerebral hemorrhage at birth. Teeth, ears and palate stigmatic.
" G. Early stealing and lying with definite object in view, over-emotional, bed-wetting.
" H. Bed-wetting, rolling out of bed during sleep. Various stigmata.
" I. Highly emotional, bed-wetting, rolling out of bed during sleep, day dreamer. Various stigmata.
" J. Highly precocious in studies, bed-wetting, rolling out of bed during sleep, night terrors.
" K. Tantrums, "forgetful," spasms at time of teething.
" L. Night terrors, recurrent dreams, somnambulism, rolling out of bed, speech defect. Ears stigmatic.
" M. Night terrors, dreams, somnambulism, bed-wetting, poor adaption at play, talking "strangely."
" N. Early mental retardation of marked degree, spasms after food.

Following is the numerical distribution of the factors brought out in analysis:

CHRONOLOGICAL AGE.		MENTAL AGE.	
YEARS	NUMBER	YEARS	NUMBER
7	2	3	2
8	2	5	4
9	1	6	1
10	1	7	3
11	3	8	3
12	3	9	4
13	2	10	1
14	1	11	1
15	1	13	1
16	1		
17	1		
22	1		
26	1		

INTELLIGENCE QUOTIENT	CLASSIFICATION (TERMAN)	NUMBER
100	Normal	3
90	Dull	2
70	Borderline	5
Below 70	Feeble-minded	10

EARLY MENTAL CONDITION AS SHOWN BY SCHOOL PROGRESS.

Backward	11
Normal	8
Precocious	1

PHYSIOLOGICAL DEVELOPMENT

Prepubescent	7
Pubescent	8
Mature	5

SEX.

Male	10
Female	10

	RANGE
Teething began	3 mos. to 1 yr.
Walking began	9 mos. to 2 yrs.
Talking began	7 mos. to 2 yrs.

Neurotic traits:

Nocturnal enuresis	13
Rolling out of bed	7
Night terrors	3
Recurrent dreams	9
Somnambulism	6
Masturbation	7
Persistent thumb-sucking	1
Tantrums	6
Over-mischievous	5
Speech defect	3
Violent fears with excessive emotional reaction	9

Anomalous teeth	9
Stigmatic palate	12
Stigmatic ears	18
Absent lobe	2
Darwinian tubercle	3
Heavy, right-angular	7
Satyriform	2
Asymmetrical	3
Unrolled helix	1

Immediate family history of:[*]

Drink	1
Drugs	1
Insanity	1
Epilepsy	2
Spasms	2
Rheumatism	7
Tuberculosis	8
Severe recurrent headache	5
Cancer	3
Chorea	1
"Skin disease"	1[†]
"Sex offender, habitual (mother)	1
"Uncontrolled temper"	5

Remote hereditary history of mental defect:

Epilepsy (maternal sister)	1
Epilepsy (paternal grandfather)	1
Chronic headache (p. and m. sibs.)	4
Convulsions (maternal sister)	1

Illegitimate	1
Instrumental delivery	3
History of family quarrels during pregnancy	4[‡]

Wassermann reaction:

Positive	9
Doubtful	4
Negative	5[§]

Attacks attributed by parent to:

"Fright"	1
Traumatic causes	4
"Punishment"	1
Unknown causes	14

Attacks dated from:

Birth	2
Infancy	12
2 to 8 years	6

Aura (Seventeen able to give satisfactory response)

Referred to abdominal region	15
Referred to head	2
Intensive visual image	2
Headache following	5

Seizures

Nocturnal and diurnal	9
Nocturnal	2
Diurnal	9
Ability to abort attacks frequently	4

Although various measurements of interest from an anthropological standpoint were taken, only those relating to cranial size will be considered here. Following are the head measurements:

	MEAN	MEAN VARIATION
Length (glabella to occipital protuberance)	18.1 cm.	.7 cm.
Breadth (max. temporo-parietal)	14.3 "	.69 cm.
Height (inter-auricular line to bregma)	13.1 "	.665 cm.
Circumference	53.0 "	.22 cm.

These figures correspond to the average for normal children.

The physical examination relating to the incidence of general somatic disease showed no unusual disturbance in the circulatory or respiratory organs. Evidence of a rachitic tendency was seen in several but no definite history to this effect was obtainable. Two showed traces of albumen with no casts or other clinical symptoms of renal disease. In none was the thyroid palpable. Two had marked exophthalmos with no other clinical manifestation of disease. In a majority the faucial tonsils were hypertrophic but not sufficiently so to obstruct normal activity. The pharyngeal tonsil, or "adenoids," was present or had been present in all, markedly obstructing the breathing of several. The superficial and deep reflexes were exaggerated in all. Several had visual defects which had been adjusted. In somewhat more than half the number the teeth were remarkably well preserved. In none were there evidences of an active tubercular process. None showed morphological evidence of hereditary syphilis. Although one subject had suffered from an attack of anterior poliomyelitis there was no residuum.

The frequency of seizures is indicated in the following table:

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[*] No family history obtained was free from one or more of the diseases indicated under "Family History."

[†] Offspring's Wassermann positive.

[‡] Three of these at two months.

[§] Of the latter, two were from highly neurotic families and one from a tuberculous family.

I. Mild Group.

		Present Condition
8-year-old girl	Frequent during infancy.	Only once in 6 years past. I.
13-year-old girl	Daily during childhood.	Only once in 2 or 3 weeks. I.
11-year-old boy	Frequent in infancy.	Once or twice monthly. N.
17-year-old girl	Daily in childhood.	Two or three monthly. I.
7-year-old girl	Frequent in infancy.	Once in two weeks. D.
26-year-old girl	Once in several months since infancy.	I.
11-year-old boy	Daily during childhood.	One every night. I.
22-year-old girl	Every two days during childhood.	Once monthly. I.
11-year-old boy	Every one or two weeks since birth.	D.
13-year-old girl	Once a month since infancy.	D.

II. Severe Group.

		Present Condition
14-year-old boy	Since infancy many mild diurnal and one severe nocturnal.	D.
12-year-old girl	Frequent since 2 years old.	Daily now. Status with complete loss of consciousness for 30 hours. D.
7-year-old boy	Since infancy.	Scores of mild diurnal and 1 severe nocturnal. D.
12-year-old boy	Since infancy.	One severe weekly. D.
10-year-old boy	Since birth.	A score daily. D.
12-year-old boy	For past 2 years, only, 1 to 3 diurnal and 2 severe nocturnal.	D.
16-year-old girl	Since infancy.	One severe daily. I. (Often a month free.)
9-year-old boy	Since infancy.	Two or three diurnal and two nocturnal. I
8-year-old girl	Since infancy.	Ten diurnal and four nocturnal. D.
15-year-old boy	Since infancy.	1 to 4 diurnal; 6 to 25 nocturnal. D.

I, Improved	8
D, Deteriorating	11
N, Unchanged	2

Following are the analyses of social behavior as exemplified in several of the protocols:

M. A. A low-grade, 8-yr.-old, moronic girl, physically overdeveloped. Over-active, inattentive, very approachable, laughing or grimacing constantly unless engaged at work or play. Easily interested in subjects for which the normal child is adapted. Delights in and discusses "movies." Makes bed under supervision and does simple housework. Untidy. No interest in clothes for herself but rather for her doll. A good mixer, an unusual mimic. A leader of other children. Initiates new situations, plays school, hospital and watches desquamation of doll ill with scarlet fever. Very mischievous, prevaricates but never steals. Generous. Had tantrums but now anticipation of punishment in bed causes temper to subside. Whimpers much. Will not be driven but may be reasoned with. Has been an excessive masturbator (several times daily) but shows much improvement through education. Does little school work, but thrives out of doors. Some violent fears, especially other children in spasms, yet so fascinated as to be riveted to the spot, screaming and kicking, eyes protruding, unable to move. Reactions to food and sleep normal. Few attacks now.

E. A. An attractive, delicate girl of 13, of normal intelligence. Highly emotional, weeping during examination but voluntarily returning for its completion. Adapts herself well to others. Fond of fairy tales but "detests love stories." Over-fond of babies. "Affectionate," loyal, but will not assert her own independence. Unjustly accused, she fails to clear herself but remains in silent, tearful mood. Various neurotic traits have been overcome voluntarily. Since sexual maturity a year ago seizures much less frequent. An excellent worker. Very eager to recover completely. Responsible, thoughtful of others, truthful, neat, very consistent, eating no meat in order to hasten recovery. Good student. Many dreams of being pursued, of wetting bed, or having to go home where environment is poor.

R. B. A boy whose chronological and mental age is 11 yrs. Head circumference of 56 cm. is in excess of normal. Cruel, obscene, tormentor, thief, tease; lies, swears and kills birds for fun. Does well in school though attention is poor. Fond of embroidery and sewing. No fears. Sullen, vindictive, not easily approached. Masturbates but no other neurotic traits. Reactions to food and sleep normal.

E. B. A coarse girl of 17 yrs., mentally 9 yrs. Reacts very slowly but a good worker. Over-emotional, fond of boys and thinks she may marry. Quarrelsome, impulsive, neat but cares little for clothes though has obsession for white teeth (hers are distinctly wolf-like). Various fears—the dark, animals, etc. Very fond of children.

M. K. A thin, spare girl of 26 yrs., mentally 9 yrs. Very loquacious. Obsessed by family troubles of many years ago. Extremely religious, praying much. A good worker, responsible. Severe temper, a residuum of early tantrums, which had been utilized in obtaining her desires. Various peculiar food reactions; is also a somnambulist. Always same aura: A visual image of a large, red moon slowly changing to an enormous deer with threatening antlers. As soon as this image runs into a hole a seizure begins. Sometimes long delayed.

E. T. A coarse, masculine girl of 22 yrs., mentally 9 yrs. Early history unknown. No neurotic traits now. Seizures infrequent but very severe. Hard worker, responsible, likes boys. Fond of detective stories only. Very religious. Sullen but tractable. Has overcome bad habits. Attention good.

If the behavior of an epileptic is analyzed his unusual conduct cannot be explained consistently and excused upon the ground that "all epileptics indicate a bad adaptation to their environment." From the very beginning of development his environment has been unfavorable, according to prevailing standards of conduct. Manifestly his adaptation to a normal environment is poor but his environment has never been normal. Owing to inability from the first to react to a normal instinctive life his reflex activities are in a primitive, unconditional state. Thus the various manifestations of the primal demands of nutrition, self-preservation and reproduction, unable to functionate in the normal manner, because of abnormal mechanisms, exhibit their rebellious disposition in the incident of the epileptic seizure with its attendant toxaemia and its train of anomalous phenomena. This fact is adequately shown in the table of neurotic traits prevailing in the present group of subjects, and may be traced in one form or another in each analysis of instinctive behavior. The fact that instincts in the epileptic operate precociously renders his conduct less deserving of censure. While the higher mental processes also may be developed precociously in a large number of cases, it is the method of response to the vegetative processes which must elucidate the mental endowment of these subjects. The relation of these instinctive reactions to the chief objective phenomenon—the seizure—is manifest in the frequent cessation of attacks following castration or after the advent of sexual maturity or, as in a case here reported, after indulgence in auto-erotic practices has become established. Again the instinct of self-preservation, with its emotional reaction of fear, is rarely well adjusted in epileptics. As an interesting coincidence may be cited two of the cases here reported, the first seizure following an intensive appeal to flight from pursuing enemies. The ease with which a seizure could be induced through the reaction of emotional stimuli characterized a large percentage of the subjects. The ability frequently to abort an attack following a definite aura, by an appeal to the digestive or nutritional apparatus, together with the remarkable frequency with which digestive phenomena usher in the premonitory phenomena, further illustrates instinctive tendencies in the evolution of the true seizure. The epileptic's failure to make a good social adjustment follows as a logical consequence of his biologic defects. Conduct results from the activity of emotions and impulses springing as natural growths from the primary instincts. As a result of the organization of these emotions, the sentiments develop,—systems of the utmost importance in the formation of character. Consequently the child having epilepsy, whose basic instincts and mechanisms are at fault, is deprived of these organized elements of the affective processes, into whose composition enter the principal emotional dispositions of the instinctive life. The natural result of this defect is an unstable and incomplete social adjustment.

SUMMARY.

1. In the foregoing analysis an attempt is made to emphasize the importance of the more intensive, biologic examination of children—in this instance, those afflicted with true epilepsy.

2. An explanation of epileptic phenomena is sought in the reactions of noxious stimuli upon the germ cell, whose environmental maladjustment appears to induce abnormal, morphological differentiations in the embryo with the power of hereditary transmission of tendencies toward defect, to succeeding generations.

3. An analysis is made of various phenomena in the social, somatic and psychic behavior of twenty subjects suffering from true epilepsy. Attention is called to these as evidence of instinctive instability.

4. The recognized hypothesis that structural abnormalities are concerned in the production of epileptic seizures is accepted and the unconditional reflex is suggested as an element in their mode of functioning.

BIBLIOGRAPHY.

Binzwanger, O.: Die klinische Stellung der sog. "genuinen" Epilepsie. Monat. f. Psychiat. u. Neurol., Band xxxii, 1912.

Clark, L. P.: Some Psychologic Studies in the Nature and Pathogenesis of Epilepsy. Jour. Nerv. and Ment. Dis., Vol. xlii, 1915.

Conklin, E. G.: Experimental Studies in Nuclear and Cell Division in the Eggs of Crepidula. Contrib. fr. the Biolog. Lab. in Princeton Univ., Philadelphia, 1912.

Hippocrates: Works. London, 1847.

Johannsen, W.: The Genotype Conception of Heredity. Am. Nat., Vol. xlv, 1911.

Morgan, T. H.: A Critique of the Theory of Evolution. Princeton, 1916.

Stockard, C. R., and Papanicolaou, G.: A Further Analysis of the Hereditary Transmission of Degeneracy and Deformity by the Descendants of Alcoholized Mammals. Am. Nat., Vol. l, 1916.

Terman, L. M.: The Measurement of Intelligence. Boston, 1916.

Werber, E. I.: Experimental Studies on the Origin of Monsters. Jour. of Exp. Zoöl., Vol. xxi, 1916.

Yerkes, R. M., and Bridges, J. W.: A Point Scale for Measuring Mental Ability. Baltimore, 1915.

SURGICAL TREATMENT OF LARYNGEAL CANCER.

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IN presenting this subject, only two procedures will be considered, viz., total laryngectomy and hemi-laryngectomy. The attempt to remove malignant growths by intra-laryngeal methods, advanced as these now are, is to be condemned. The eradication of cancer by thyrotomy is an ideal method, conserving the normal breath-way and a varying degree of audible speech. But it is applicable only in the most incipient cases. It is conceivable that improved diagnostic skill on the part of the profession at large may bring these cases to operation at a stage sufficiently early to justify a more frequent use of thyrotomy. My experience with it has been discouraging, giving a large return of hopeless recurrences.

Recurrence after thyrotomy means increased malignancy and irreparable loss of time. I firmly believe that the surgeon is given but one chance to eradicate cancer, wherever situated.

In border-line cases the patient's feelings may determine between total and partial removal, some preferring even death to a voiceless existence. When in doubt and the choice of operation is left to the surgeon, the larynx should be split and its interior inspected, then partly or totally removed, as seems advisable.

The degree of malignancy, as determined by the history and appearance of the growth, must be taken into account. When any doubt exists as to the best procedure, I would strongly advocate the more radical one. If the growth approaches close to the median line in the anterior or posterior commissure, total laryngectomy is indicated. If the arytenoids be involved, a liberal portion of the anterior part of the mouth of the esophagus should be resected with the larynx.

In total laryngectomy, I prefer the one-stage operation for the following reasons. When a preliminary tracheotomy is done and the trachea surrounded with gauze to establish peritracheal adhesions, the object aimed at is to prevent extension of infection to the mediastinum. This possible good is out-balanced, in my opinion, by the fact that at the second stage we are forced to operate in a well-established septic field. Another objection is that a primary union between the skin and tracheal mucous membrane is seldom possible when the trachea has been mutilated and the surrounding tissues infected. A clean union here means that the patient may dispense with the tracheal cannula. To wall off the trachea at the first stage and to leave it closed, would, I believe, be a more logical procedure in the two-stage operation.

Many points of interest arise in laryngectomy which, owing to limited time, I may but touch upon.

I am often asked, what is the mental state of these patients after partial or total laryngectomy? Their acceptance of the new conditions under which they are forced to live has been to me a great surprise. Those who have escaped a recurrence, or who think they have escaped it, are extremely grateful and uniformly cheerful.

Several of my laryngectomies have developed a remarkable degree of speech. Two of them have acquired a whisper, conveying words at short range.

In what cases should the gland-bearing tissue of the neck be removed? Unless this is thoroughly done, it is worse than useless. By the removal of gland-bearing tissue, I mean that all the fat and fascia of the region should be taken away by a painstaking dissection, carried well backward into the posterior triangle and upward into the submaxillary region and downward to the clavicle.

When the arytenoids are involved, it is almost certain that the disease has entered the lymphatics of the neck, necessitating their removal. If the median line is encroached upon, the dissection must include both sides.

How much of the esophagus may be removed without damage to its function? In all cases I remove the anterior part of the mouth of the tube, the extent being determined by existing conditions. At least one inch downwards anterior and one third of its circumference has been resected in five cases, without producing subsequent stricture.

Primary union is the exception in total laryngectomy. The wound infection in all my cases began above at the pharyngeal closure, manifesting itself between the third or fourth day. Liberal opening with drainage prevents or retards its spreading downwards to the danger zone behind the tracheal stump. This retardation is an important factor in the prevention of mediastinal infection, giving the retrotracheal region time to become walled off. Wound infection with sloughing may not, after all, be an unmitigated evil, since it may, by the eradication of disseminated cancer cells, tend to retard or prevent recurrences. It has, I believe, done so in two of my cases.

In no case have I failed to secure primary union in the subsequent plastic repair following even extensive destruction of the tissues. The most important point here is to delay operation until long after the suppurative stage has passed.

Shock, pneumonic sepsis and mediastinitis are the ever-present dangers of laryngectomy.

Shock. Very old and decrepit individuals should not be subjected to this operation. As short and light a general anesthesia as possible should be given. In selected cases, I would suggest the use of local anesthesia carried as far as can be done without pain, that is, to the skeletonization of the larynx and trachea, then light general anesthesia during the detachment of the larynx from the neck and the closure of the pharynx. The operation may then be finished under local anesthesia. Thus the ether period should not last more than twenty to thirty minutes.

Pneumonia—short and light general anesthesia—the prevention of the entrance of blood into trachea during operation and of wound drainage after operation, and the removal of tracheal secretions by suction, materially lessen the danger of pneumonia.

Sepsis. Diseased teeth and chronic sinusitis may be overlooked factors in the production of virulent septic wound infection in any case where the pharynx is opened. I strongly advocate the removal of diseased teeth at a period as long before the operation as possible.

The removal of tissue for diagnosis is to be avoided, if possible. Syphilis must be excluded.

Before describing the technic I shall ask your permission to digress and point out what seem to me to be some of the important points in the management of laryngectomy.

1st. The operation should be so conducted as absolutely to prevent blood entering the trachea during the operation.

2d. Wound contamination from the open trachea and pharynx should be guarded against during the operation.

3d. In total laryngectomy two lines of drainage are indicated,—one just below the pharyngeal closure and the other just behind the tracheal stump, where it is secured to the skin. The latter is of prime importance, crossing, as it does, the direct path of mediastinal infection. In this situation, unprotected, weak iodoform gauze is used to promote adhesions. If the infection from above can be delayed a few days (and in all of my infected cases it has been so delayed), the danger zone behind the trachea is eliminated and a primary union between the trachea and skin promoted.

4th. A nourishing and properly balanced diet is essential from the start. The only means of accomplishing this is by the use of the feeding-tube, introduced into the esophagus through the nose and left in place until the wound is healed. In one case the patient was thus fed for two months without producing esophagitis.

5th. When infection occurs, strict attention to drainage is imperative. The dressings should be changed every two hours or oftener during the day and every three or four hours during the night. At each dressing a negative pressure pump is used to remove the pus and tenacious mouth and pharyngeal secretions from the wound.

6th. The total absence of lung complications in my cases was partly due, in my opinion, to the use of inter-tracheal suction applied through a small catheter, introduced as far down as the bifurcation. This is used as indicated by the amount of tracheal secretion at least every hour or two for a few days following the operation.

Two physiological principles underlie the expulsion of secretions from the trachea, namely, normal ciliary action and normal cough. By normal cough I mean the compression of air behind the closed glottis and its expulsion by a sudden release of this closure.

In the open trachea normal cough is impossible and, following operative traumatism, the ciliary action of the tracheal mucous membrane is at least temporarily in abeyance. Hence there is a tendency for secretions, much increased after laryngectomy, to enter the lungs, producing well-known consequences. On this argument I contend that intratracheal suction rests on a logical basis.

The operation for hemilaryngectomy is my own. Its radical departure from the accepted method of Gluck makes me put it forward with some hesitation. It has been done in six cases with six surgical recoveries. In all but one the larynx remained sufficiently open for normal breathing. In one there was some contraction, causing slight dyspnoea on exertion, and audible breathing at all times.

The operation for total laryngectomy is essentially the accepted method of the one-stage operation, with some modification of my own in the technic and in the after-treatment.

OPERATION FOR HEMILARYNGECTOMY.

Operation. If it cannot be decided whether a thyrotomy or a hemilaryngectomy is to be done, the larynx should be first opened for inspection. Then, if hemilaryngectomy is elected, before proceeding further with the operation, the trachea is opened just above the sternal notch. Two separate incisions are made, one for the laryngectomy and another for the tracheotomy. The first incision begins well up under the chin and extends to a point just below the cricoid ring in the centre line. This is deepened until the thyrohyoid membrane, the thyroid and the cricoid cartilages are exposed. Care is taken not to separate the tissues laterally. The larynx is then opened in the center line, its interior cocainized and inspected. Blunt hooks or retractors are used in order to avoid injury to the edges of the cartilage, especially on the healthy side.

A hemilaryngectomy being decided upon, the trachea is next opened as low as possible. The second incision is here made, over the end of the sternal notch and up to within one inch, or more, if possible, of the first incision. Care is taken that a liberal bridge of tissue is left between the two incisions. The trachea is opened and a large tracheal cannula inserted. Into this is fitted a rubber tube, eighteen inches long, through which the anesthetic is continued. Before inserting the tracheal cannula, two stout silk threads are passed through the edges of the tracheal incision, one on each side and laid one on each side of the neck. The wound is then closed fairly close up to the cannula. The object of the silk threads is to control the tracheal opening, in case the tube should get displaced or come out. Traction on these threads opens the trachea. This precaution I always take in low tracheotomies.

The larynx is again opened with blunt hooks or narrow retractors. The trachea is cocainized and tightly packed with gauze. The skin, cervical fascia, and pre-tracheal muscles covering the diseased half of the larynx are carefully dissected away from the cartilage, taking care to keep them all in one flap and not to injure the inner surface, which is composed of the pre-tracheal fascia, as this surface is to form the new laryngeal wall. This flap is gently held away while the removal of half of the larynx proceeds. The thyrohyoid membrane is slit laterally and the trachea divided below the cricoid ring on the diseased side. A large wad of iodoform gauze is packed into the pharynx to prevent contamination from that quarter. This is removed through the mouth when the operation is near completion. The loosened half of the larynx is now retracted, well away from the centre line. If the mucous membrane over the posterior commissure and arytenoid is healthy it is saved and lifted away from the cartilage beneath. This mucous membrane dissection is carried backwards over the posterior surface of the arytenoid and down towards, and sometimes into, the anterior aspect of the mouth of the esophagus. The diseased half of the larynx is now removed in the usual way, being careful to save the mucous membrane flap outlined above. All bleeding points are controlled by catching only the vessels and by tying with an 00 iodized catgut. Stress should be laid upon careful and non-traumatic hemostasis. I would here digress to say that the usual rough handling of tissues, so frequently seen in general surgery, is entirely out of place in this operation. Much in the ultimate result depends on gentleness. The next step in the operation is to endeavor to cover as much as possible of the raw surface left by the hemilaryngectomy with mucous membrane. The flap mentioned above is brought downward and inward. It may sometimes be further enlarged by splitting the mouth of the esophagus. A considerable part of the raw surface left by the removal of half of the larynx may thus be covered. Stitches of fine, iodized gut are placed so as to hold the flap in its new position, care being taken that tension is avoided. The tracheal packing is now removed and the trachea cleared of blood clot down to the cannula. A long, half inch, folded strip of vaselined gauze, thoroughly impregnated with bismuth, is packed into the trachea, filling it from the cannula to its open end. This strip should be folded back and forth in the trachea, so that its removal may be more easily accomplished, and it should be packed in tight and even. To prevent the lower end of the gauze from falling into the trachea and to facilitate tight packing, a drawing-string is run through the gauze, being attached to its lower end. When the packing is in place this string is drawn up, thus approximating the two ends of the gauze. This corks the trachea against secretions from above. The end of the strip is brought out at the lower end of the laryngeal incision. The larynx is packed loosely with a strip of iodoform gauze, the end of which is brought out at the same point as the tracheal packing. The gauze in the pharynx is removed through the mouth and the feeding-tube is inserted through the nose and directed into the esophagus.

Closure. The mesial edge of the pre-tracheal muscles (the under surface of the lateral flap) is now united to the mucous membrane of the healthy side of the larynx, along its anterior median aspect, using fine iodized gut. The skin edges are united with silkworm gut. The wound is left open at its lower angle, wide enough to give drainage room for the gauze ends. Two provisional stitches are placed here to be tied after these strips are removed, thus entirely closing the larynx. A sheet of rubber tissue, covered on both sides with gauze, is glued by its edge with collodion to the neck, across the bridge of skin separating the two wounds. This attachment should extend laterally one-half way around the neck. Its object is to act as a barrier between the laryngeal wound and the tracheal cannula, keeping the drainage of the one away from the other. The quantity of drainage that comes from the laryngeal wound saturates several pads of gauze a day, and makes one feel that if only a fraction of it should find its way into the lung through an open trachea, pneumonia might well be the result. The bismuth in the trachea plug keeps it clean and odorless for days and with the vaseline effectually turns the drainage out towards the surface.

After-Treatment. There are a few points in the after-treatment on which I would lay emphasis.

Paramount, in this regard, is a liberal and supporting diet. Without the use of the esophageal tube it is impossible to give enough food to support these patients through the important early days of convalescence. The diet I prescribe is as follows: Oatmeal thoroughly cooked and strained, mixed with milk. To the above may be added milk-sugar and raw egg, and occasionally melted butter. Six ounces of this thick mixture are forced through the tube with a piston syringe every four hours, followed by four ounces of water. Fruit and vegetable juices are later added.

The esophageal tube may be retained for weeks without injury, providing it is washed out after each feeding, as stated above. If by accident it should come out and cannot be replaced, I would not hesitate to do a gastrotomy, so important do I consider liberal feeding. Rectal feeding, in my opinion, should not be relied upon. It is merely an effective way of pretending to do something.

In some cases tracheal and bronchial secretion is much increased. In one case, a diabetic, crusts and plugs of inspissated muco-pus formed in the trachea and primary bronchi and had to be removed with a bronchoscope and forceps twice a day, to obviate suffocation. A negative pressure pump is used to unload the trachea as often as indicated. Strong suction may do much injury to the mucous membrane and should be avoided.

The dressings need constant attention. They should be changed every few hours. The patient's position should be frequently shifted from side to side and from the recumbent to the reclining posture.

When the laryngeal drain should be removed depends upon the amount of drainage. It should be kept in as long as the serous flow continues. In my limited experience this is from two to four days. I remove the tracheal plug later for the reason that the blood and serum which flow into the larynx when disturbed by the drainage removal is thus prevented from entering the trachea. The tracheal plug may remain from three to five days. The tracheal cannula should be removed just as soon as the new larynx is open for comfortable breathing. If there is much tracheal secretion, tracheal drainage is best served by keeping the cannula in and using suction.

OPERATION FOR TOTAL LARYNGECTOMY.

At the cancer age clean mouths are the exception. Carious teeth and Riggs' disease make this cavity a veritable cesspool into which our operative field must extend, and out of which must come almost unavoidable infection. Before operation this condition should be remedied as far as time will allow. Chronic sinusitis must be borne with since it would be quite impossible to correct it in the time given. Any effort in this direction would but change a chronic into an acute process, with added risk of wound contamination.

If the patient will submit, the preliminary part of the operation may be done under local anaesthesia, carried as far as the tolerance of the patient and the skill of the operator permit. When the larynx is filled with carcinoma and the breathing is obstructed, local anaesthesia obviates the danger of suffocation and of an emergency tracheotomy during the early stage of the operation. Such a tracheotomy would mutilate the tracheal stump, making the subsequent skin and tracheal union defective. It is quite possible to skeletonize the larynx and upper portion of the trachea without pain. At this point it is better, I believe, to begin the general anaesthetic rather than attempt the removal of the larynx by the local method, since gagging, vomiting and coughing hinder the surgical procedure and add another infective factor.

If scopolamine-morphine has been given, great care in the administering of the general anaesthetic must be taken to guard against respiratory failure. I am inclined to use as little as possible such noisy adjuncts as the insufflation anaesthesia apparatus which interferes with the close observation of the patient's respiration. The removal of the larynx and closing of the pharynx is done under light ether anaesthesia. The remaining steps of the operation are better done under local, with an occasional whiff of ether if needed.

When, owing to the extent of the disease, a block dissection of the neck is indicated, the procedure is as follows:

An incision from the chin to the sternal notch is made, including all the tissues down to the deep fascia. From the upper end, extending laterally on one or both sides, a second incision is carried outward across the sternomastoid just under the mastoid process. The third incision begins at the lower end of the first one and is carried outward and downward, crossing the clavicle near its outer third. The object aimed at is to make the flap as wide at its base and as thick as possible. My experience with the rectangular flap, generally used, has been that the inner edge is prone to slough from lack of nutrition. Much time is often wasted in trying to save the sternomastoid muscle. It is my custom to remove it entirely, thus gaining an immediate and good exposure of the deep structures of the neck. It is detached below and with it all the underlying gland and lymphatic bearing tissues are removed *en masse.* The wound is packed with gauze and the removal of the larynx proceeded with.

When a block dissection is not indicated, the procedure is as follows:

The first incision, as described above, is made. From its upper end two incisions are carried laterally for about one inch. This wide opening on top gives better access to the work of closing the hypopharynx. In long, thin necks the lateral incisions may be dispensed with. The thyroid bridge is tied and cut. In three cases I have been obliged to remove a portion of the thyroid gland overlying the trachea. The larynx and trachea are skeletonized and the thyrohyoid membrane exposed. The greater wings of the thyroid cartilage are cut and left in position. All vessels are tied and the wound made perfectly dry. The trachea is cut across just below the cricoid cartilage, being careful to secure all bleeding points so that no blood enters the trachea. A rubber tube ten inches long and large enough to fit tightly is inserted into the trachea. Through this tube the anaesthesia is continued. The cleavage plane between the larynx and esophagus is now found and the larynx separated upwards as far up as is compatible with the extent of the growth. If the cancer extends backwards into the esophageal mouth, that portion of the latter lying in juxtaposition to the larynx must be removed. The larynx is allowed to drop back into position and the thyrohyoid membrane is cut across, opening the hypopharynx; a large piece of gauze, either of iodoform or wrung out of a one per cent. Dakin's solution, is crowded into the pharynx, filling it and the mouth. The larynx is removed, either taking or leaving the epiglottis. The hypopharynx is closed with two lines of chromic gut sutures. Before the first line is entirely closed the gauze is removed from the mouth and a feeding-tube of suitable sized rubber is passed through the nose and guided into the esophagus to a depth of five or six inches. I have seen persistent vomiting caused by inserting the tube too far. Two lines of drainage are indicated—

one just below the hypopharyngeal closure and the other behind the tracheal stump. They are inserted through stab wounds in the flaps. If a gland dissection has been done, a third drain is placed in the lower outer angle of the wound. The wound is then closed in layers with number two iodized gut, or it may be closed *en masse* with silver wires piercing the tissues deeply and clamped with large shot.

The tracheal stump is pulled forward and two retention sutures of silkworm gut or silver wire are passed around the third or fourth ring, using a sharply curved, stout needle. The ends of these are plunged through the tissues and brought out about one inch from the central incision on either side of the trachea. They are tied around a piece of gauze, sufficient tension being exerted to hold the stump forward. A cuff of mucous membrane is made at the tracheal end by removing the cartilage of the first ring. The subcutaneous fat is removed from the skin in the immediate vicinity of the stump to facilitate bringing the skin and mucous membrane together. Union is made with horsehair on the front and sides of the stump and with silkworm gut behind. Tension must be avoided in joining the skin and mucous membrane. A large cannula wound with iodoform gauze and smeared with vaseline is inserted into the trachea, fitting its caliber snugly—an eight inch square of rubber-dam, perforated in the centre is snapped over the exposed end of the inner tube of the cannula. Behind this apron the wound is dressed in the usual way. The cannula inserted, as above described, effectively corks the trachea, preventing secretions from being coughed up over the tracheal skin union. The rubber apron catches all tracheal secretions and serves as a barrier between the end of the cannula and the wound of the neck.

After-Treatment. Feeding and the care of the tracheal secretions are set down under the after-treatment of hemilaryngectomy. As wound infection is the rule in total laryngectomy, its proper surgical management is, perhaps, the most difficult and most important part of our task. Infection begins, as a rule, at the hypopharyngeal closure. To delay too long in opening the upper part of the wound is a fatal error, since the virulence here encountered is high and the infection spreads rapidly. After the wound is opened the packing should be changed every two to four hours and the field cleared of secretions by suction. The continuous or intermittent use of hypertonic salt solution does much to promote exosmosis and thin the discharges. If the infection extends to the tracheal region constant attention on the part of the nurses and surgeon is required to prevent the inhalation of pus and its extension to the mediastinum. All burrowing pockets are carefully followed, frequently packed and cleansed by suction. Nowhere in the body, with the exception of the brain, is uncontrolled infection more serious than in the neck. Such success as has come to me in this work has been, I believe, due to the time and pains taken in the after-treatment, to the use of very little general anaesthesia, and to a constant effort towards the elimination of traumatism from the operative technic.

THE MASTICHE AND POTASSIUM PERMANGANATE TESTS APPLIED TO THE CEREBRO-SPINAL FLUID OF THE INSANE.[*]

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A. In the *Berliner Klinische Wochenschrift* for July 26, 1915, G. Emanuel describes a new colloidal reaction for use in examining cerebrospinal fluid.

The technic is as follows: Dissolve 10 gms. mastiche in 100 cc. of alcohol. Filter. Take 1 cc. of the above stock solution and add to 9 cc. of alcohol. Insufflate rapidly into 40 cc. of distilled water. This is the reagent. It is a pearly gray, opalescent solution with a slight bluish tinge. One cc. of 1.25 per cent. sodium chloride solution will flake out 1 cc. of mastiche reagent. Set up 5 tubes. In the first put 1.5 cc. of the 1.25 per cent. sodium chloride solution: In the others, 1 cc. To the first tube add 0.5 cc. of spinal fluid. Mix. Transfer 1 cc. to the second test tube: mix; and so on for the first 4 tubes, throwing away 1 cc. from the fourth. The fifth is used as a control.

Now add 1 cc. of the mastiche reagent to each tube. A positive reaction is evinced by a prompt precipitation in all 5 tubes. The reading is made at the end of 12 hours. This occurs in paresis or other syphilitic nervous disorders. In 32 cases Emanuel found the test negative in all but the 14 syphilitic. One case of dementia praecox, 1 of traumatic neurosis, and 1 of hemorrhage gave faintly positive reactions, but not to be compared with the pronounced reaction of paresis.

On account of the simplicity of the test and the statement that it is as reliable as the gold reaction, it seemed worth while to try it in the laboratory. Fluids from 35 cases were examined, the test being controlled by the routine tests of this laboratory (Wassermann reaction, albumen and globulin content, cell count and gold reaction).

The dilutions were made, the reagent added and the tubes thoroughly shaken. They were then examined at the end of 5 minutes: after one to one and a half hours, and finally at the end of 18 hours. As a general rule no change or at most a very slight change occurs between the hour and the 18 hour observations.

In 3 cases, 10 tubes were set up; the 10th used as a control: the other 9 containing fluid dilutions of 1 : 2 to 1 : 512. In all 3 cases whether positive or negative the last 5 tubes precipitated—*i. e.*, the amount of restraining (?) substance in these dilutions of the fluid was not sufficient to prevent precipitation.

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[*] A contribution to the William Leonard Worcester Series of Danvers State Hospital Papers, presented November 19, 1915.

Three general types of reaction may be recognized. In the first the completed test solution is "clear" (*i. e.*, only slightly opalescent); in the second the solution is "cloudy" or opaque; in the third flocculent precipitation occurs, the supernatant fluid being clear.

The results of the test are given in the appended table (I) in which the fluids are arranged according to the gold reactions.

TABLE I.

	GOLD POSITIVE	1	2	3	4	CONTROL 5
M.	General paresis	cl	cl	cl	cl	p
F.	General paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	Tabo-paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	General paresis	cl	cl	cl	cl	p
M.	General paresis	c	c	c	cl	p
M.	General paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	General paresis	p	p	p	p	p
M.	General paresis	cl	cl	cl	cl	cl
M.	General paresis	p	p	p	p	p
M.	General paresis	cl[1]	cl	cl	cl	p
M.	General paresis	cl	cl	cl	p	p
M.	General paresis	cl	cl	cl	cl	p
M.	General paresis	p	p	p	p	p
M.	General paresis	cl[2]	cl	cl	cl	p
M.	General paresis	p	p	p	p	p
M.	Cerebrospinal syphilis	c	c	c	cl	p
	GOLD NEGATIVE	1	2	3	4	CONTROL 5
M.	Arteriosclerosis	c	c	c	c	p
M.	Imbecile	p	p	p	p	p
F.	Senile dementia	c	c	c	c	p
F.	Imbecile with syphilis	c	c	c	cl	p
F.	Manic depressive	c	c	c	sl cl	p
F.	Manic depressive	c	c	c	cl	p
M.	Arteriosclerosis	cl	cl	cl	p	p
F.	Organic	c	c	c	p	p
F.	Dementia praecox	c	c	c	cl	p
M.	Dementia praecox	slightly cl	cl	cl	cl	p
M.	Dementia praecox	c	c	c	c	p
M.	Alcoholic	cl	p	p	p	p
M.	Alcoholic	c	c	c	c	p
	Gold tumor type					
M.	Glioma	c	c	cl	sl p	p

c=clear; cl=cloudy; p=precipitate
M=male; F=female

[1] Contaminated
[2] Bloody

Some contaminated and bloody fluids were purposely included in the series in order to determine what difference, if any, this would make. If there was any difference (which is not demonstrable) it was in the direction of rendering a positive reaction negative. Of 21 fluids in which the gold reaction was positive (all from cases of nervous syphilis) 9, or 43 per cent., did not give precipitation in any of the test dilutions (except 1 in a 1:16 dilution). Seven gave "cloudy" solutions and 2 "clear" solutions. In both of the latter the 1:16 dilution was "cloudy." Among 13 cases not due to syphilis in which the gold test was negative, 2 gave positive mastiche tests and 2 others showed precipitation in the 1:16 dilution; in 4 cases all test dilutions were "clear" and in 5 more only the 4th showed "cloudiness" or precipitation. Two cases were "cloudy" in all test dilutions.

One interesting case is the following:

> A male tabo-paretic had several times given a weakly positive gold reaction (tabetic type). Fluid removed from the lumbar region at autopsy gave the following gold reaction: 4-5-5-5-5-4-4-2-0-0. Fluid from the base of the brain gave: 5-5-5-5-5-5-4-2-1-0. The mastiche test gave at the end of an hour:
>
> Cord: cl-p-p-p-p
> Base: p-p-p-p-p
>
> At the end of 18 hours all tubes in both tests were precipitated.

The significance of "clear" and "cloudy" solutions and of precipitation in the fourth tube is by no means certain. We cannot assume that cloudy solutions and precipitation in one tube are to be regarded as evidence of a positive test, since both changes occur in fluids which otherwise are negative. If we are to regard as positive only those cases in which precipitation occurs in all tubes it is evident that the percentage of positive tests in the group here reported is very low and that the test does not offer a very safe means of determining the presence of syphilis of the nervous system.

Considering the data in this light it seems obvious that the mastiche test is not a valuable addition to our diagnostic armamentarium. It obviously cannot do the work of the gold test and does not seem to add any information which cannot be obtained from other tests.

B. P. Boveri described the following test in *Riv. di Patol. Nerv. e Ment.* p. 280, 1914. To 1 cc. of spinal fluid add slowly down the side, 1 cc. of 1 per cent. potassium permanganate. In a normal fluid the contact zone shows no color change. Having observed the ring the fluids are mixed. If the fluid is pathological the mixture assumes a straw-yellow tint.

Reactions are classified as follows: strong reaction, change in less than 3 minutes; moderate reaction, change in 3 to 4 minutes; weak reaction, change in 5 to 6 minutes. Changes occurring after 6 minutes have no meaning.

The test is said to be best marked in myelitis: to be more sensitive than the Nonné and Noguchi, but not parallel with them, and not parallel with lymphocytosis.

I have not had opportunity to use the test in myelitis cases. My cases are of cerebral rather than cord diseases. This may perhaps explain the aberrant findings here recorded. At any rate it does not appear that the test is of value in the examination of spinal fluid from the insane.

The ring test showed a reddish zone in only 1 case—in the others nothing. The first appearance of the shaken mixture was "transparent purple" in 3 cases: "opaque purple" in 17. The 3 cases eventually gave a transparent red-straw color (6 minutes : translucent red at the end of 2 minutes). All 3 of these fluids gave a positive Noguchi test and were from cases of paresis. The tests of the other 17 cases remained opaque purple in color throughout the time of observation. Of these, 8 gave a negative Noguchi test, 2 contained blood and 7 gave positive Noguchi test and were from cases of paresis.

From these data it seemed unnecessary to proceed further with the test.

CONCLUSIONS.

From the data presented dealing with the mastiche test on 36 fluids; and the permanganate test on 20 fluids from insane persons, the conclusion is drawn that neither of these tests is of sufficient value to become a part of the routine examination of spinal fluids from the insane.

Bibliography.

Emanuel, G.: Eine neue Reaktion zur Untersuchung des Liquor Cerebrospinalis. Berliner klin. Woch., lii, July 26, 1915.

Boveri, P.: Di una nuova reazione del liquido cefalo rachidano. Riv. di. Patol. Nerv. e Ment., xix, p. 280, 1914.

Clinical Department.

FRACTURE OF THE CUBOID BONE.

By Wm. Pearce Coues, M.D., Boston.

In the last few years many isolated fractures of the tarsal bones have been brought to light by the increased use of radiographs in the diagnosis of obscure injuries of the foot. Isolated fracture of the cuboid is one of the most uncommon of these unusual fractures and receives scant mention in many modern treatises on fractures.

Present-day experience demands that particular attention should be given all foot injuries caused by indirect violence, where the force seems too slight to produce a fracture. These are often the cases where a radiograph is not taken, and the case treated as one of sprained ankle or sprained foot. Often the clinical symptoms of these cases of isolated fracture are so obscure that the most painstaking clinical examination may not be positive as to fracture, and a radiograph is indispensable for a correct diagnosis. This refers to the fractures from indirect violence without any appreciable displacement, and not to those crushing injuries, where the diagnosis of tarsal fracture is at once apparent clinically, and the only question is how many and just what tarsal bones are fractured.

The shape and anatomic position of the cuboid bone make it extremely difficult to obtain many of the classic signs of fracture, when this bone is injured, and linear cracks and splits are produced without much or any displacement. Point tenderness and the situation of the ecchymosis will prove most valuable signs in the absence of more definite symptoms. The situation and character of the swelling may also serve to show, at least approximately, the site of the possible fracture.

Report of a case:

Walter C., a boy of 11 years, was seen at the surgical clinic of the Boston Dispensary, on April 21st, 1915. He had always been well, and had no previous fractures. On April 20th, he turned his left ankle sharply, while running. He immediately felt much pain in the foot, and was unable to walk afterwards without much disability. Examination showed a well-developed and nourished boy of 11 years. He was unable to put the left foot to the ground without much pain. There was a moderate amount of swelling over the dorsum of the left foot, and slight ecchymosis over the external border of the foot. There was no crepitus obtained, but there was considerable pain on pressure over the base of the 5th metatarsal bone. Posterior to this, in the cuboid region, there was exquisite pain on pressure. Extension of the little toe gave some pain in the foot, but not definite pain in the 5th metatarsal. The x-ray showed a linear crack through the cuboid, without displacement. A cast was applied to just below the knee, and the boy given crutches. May 15th the plaster was removed, and June 5th the boy was discharged well, all tenderness having disappeared, and the foot being used without pain or discomfort.

Le Dentu and Delbet[1] have given a most recent and full account of this fracture, and say that Plagemann found one case of cuboid fracture in 114 fractures of the foot. Immelmann, in studying 20 cuboid fractures found 12 isolated, and 8 associated with fracture of other bones of the tarsus. Tanton[1] remarks that the cuboid, the key to the plantar arch, is practically never fractured in indirect traumatism of the foot. He considers that these extremely uncommon cases of fracture by indirect violence are most often caused by a fall from a height, on the toes, with the foot in hyperextension. Also exceptionally, he thinks they may be caused by antero-posterior compression of the foot, the heel being fixed on the ground, with violent pressure being exerted on the toes. A third possibility is given, also,—forced pronation of the foot, with at the same time abduction of the forefoot.

In the case recorded above there was no history of a blow and, as is often the case, the patient was unable to say just how the ankle "turned." It would seem probable that the third manner of production of the fracture was the one responsible for its occurrence in this case, a forced pronation, with abduction of the forefoot.

A number of rare anatomic variants may cause confusion in certain cases of cuboid fracture, even with good radiographs as an aid to diagnosis. Among these are the shell-like epiphysis at the base of the 5th metatarsal bone, which sometimes remains without bony union to the base of the metatarsal, and the vesalianum, or bone of Vesalius, at the base of the 5th metatarsal. Occasionally there is a secondary oscalcis, a small bone between the scaphoid and cuboid, which may cause confusion, in question of cuboid fracture.

The possibilities of mistaken diagnosis which come to light in the study of only one rare tarsal fracture makes apparent the necessity of careful radiographic study of these injuries.

REFERENCE.

[1] Le Dentu et Delbet: Nouveau Traité de Fractures. Vol. i, pp. 37-40.

A CASE OF HENOCH'S PURPURA.

BY EDWIN D. GARDNER, M.D., NEW BEDFORD, MASS.

THE following case of Henoch's purpura seems to me unusual and deserving of report:

M. C., 7-year-old school-girl. Mother has had pulmonary tuberculosis, apparently healed. Otherwise family history is negative. Past history: for the last year has complained 5 or 6 times of having colicky pain in the region of the umbilicus. Mother says that child would be out playing and would come home complaining of this pain and no other symptoms. Child would lie down for an hour or two and then would feel all right. Child has had a lot of colds and sore throats. Past history otherwise negative. Present illness: seven days ago child came in complaining of the same pain as described above. No nausea or vomiting. Bowels all right. No fever. This lasted for twenty-four hours. Three days ago complained of a sore throat. Her mother took her temperature and found it was 102° F. Child had headache and backache. In twelve hours the child said her throat was well and temperature was normal. About this time, however, she began to complain of the same abdominal pain as described above only more severe. At this time the family physician was called in, the pain continued and twelve hours later the child began to vomit. She vomited very frequently, ten or twelve times a day, the vomitus consisting of mucus streaked with bright red blood. The pain and vomiting continued until I saw her, when she said the pain was less and she was vomiting less frequently. The bowels were constipated but a good result was obtained by enema. No blood in the stools. No cough. No urinary symptoms. The physician said that since he had seen the child there had been no signs of trouble in the throat and no fever. He also said that the physical signs were the same now as they had been.

Physical examination: Temp. 99.4, pulse 90, respiration, 22. General examination negative, save the abdomen, which was level and tympanitic throughout. No masses or organs made out. No spasm or, if any, very slight and in the right rectus. Moderate tenderness on deep pressure over McBurney's point and in region of umbilicus. No other tenderness. No jaundice. No herniae. No costo-vertebral tenderness. Reflexes normal. Rectal examination was negative, save for slight tenderness high up on right side. Urine clear—acid 1020, alb. 0. Sugar 0. Sediment—rare leucocyte and round cell. Many squamous cells. White count 20,000. Hemoglobin normal. I advised an operation for fear it was appendicitis. The appendix looked normal. In the ileum, about six inches from the ileo-caecal valve, was a soft, smooth mass that gave the feel of putty. It was reddish brown or purplish in color and seemed to be in the lumen of the intestine, as it could be milked along. It was about the size of an olive. It gave the appearance of a blood clot. There was a similar mass about two inches proximal to this. Exploration of the abdomen revealed nothing further. On opening the appendix it was found filled with blood clot. The mucous membrane was normal except that it seemed a little edematous. The patient was troubled for two or three days with bronchitis. No pain or vomiting. On the fourth day temperature rose to 101° F. Abdomen and wound negative and the bronchitis was considered the cause. On the fourth day there was considerable dark blood in the urine and stools. This continued for twenty-four hours and then disappeared. On the fifth day the left ear began to discharge pus and the temperature dropped to normal. The ear continued to discharge for two or three weeks. The child insisted that she had no earache at any time. The mother told me at that time that the child had had considerable trouble with her ears previously. Except for the ear the convalescence was normal, the wound healing by first intention and no return of pain or vomiting. Four weeks after the operation the family physician was called to see some spots on the child's legs. These were typical purpuric spots. She had them scattered over her body, but principally on her legs. They lasted about one week. Since that time, so far as I know, the child has been perfectly well.

I am indebted to Dr. Charles A. Pratt of New Bedford, who referred the case to me.

Society Reports.

NEW ENGLAND SOCIETY OF DERMATOLOGY AND SYPHILIS.

The seventh meeting was held at the Massachusetts General Hospital on February 14, 1917, with the President, Dr. Abner Post, in the chair.

The following cases were presented and discussed:

1. SEVERE BURN.

Presented by DR. THORNDIKE.

The patient was brought before the Society because of the perfect usefulness of her arm despite its extraordinary and extensive deformity. When four years old the right arm was burned and yet, notwithstanding the tremendous contraction, she has absolutely normal motion in all joints. There is no suggestion of keloidal or hypertrophic scarring and the skin is very soft. There is, however, a suggestion of chronic eczema which accounts for the infiltration of certain areas. The woman has followed the trade of dressmaker and has raised a family.

2. DERMATITIS VENENATA.

Presented by DR. THORNDIKE.

The patient was a blue print dipper and presented a dermatitis due to bichromate of potassium—the third instance observed by the speaker during the present winter. The other two cases were diffuse inflammatory lesions on the hands, while the present outbreak is strikingly limited to superficial ulcerations on the fingers which the man uses in dipping his blue prints.

3. X-RAY PLATES OF OLD SYPHILIS.

Presented by DR. THORNDIKE.

During the winter the speaker has observed ten cases of syphilis of the leg bones, all of which have shown profound syphilitic lesions and have given negative laboratory findings.

In the plates shown both bones of the leg appear to be involved. The periosteum is greatly thickened and the "cuticle" layer is also affected. There is no suggestion of tuberculosis or of any traumatic lesions in the patient's history and no history of luetic infection could be elicited, but with the x-ray evidence and with the satisfactory therapeutic reaction obtained thus far, a diagnosis of syphilis should be made. The patient has a heart lesion, is a heavy drinker and also suffers from arteriosclerosis.

4. PEMPHIGUS OF TONGUE AND CHEEKS.

Presented by DR. C. M. SMITH.

The process has lasted two years and the lesions have thus far been limited to the mouth. Dr. A. Coolidge, laryngologist, agrees that the lesions are those of pemphigus and that the manner in which fresh outbreaks occur is distinctly in line with the usual course of oral pemphigus. The patient has been observed in two different outbreaks of distinct, vesicular lesions, one attack limited to the cheek and the other to the tongue. The lesions always begin as vesicles, and in the last attack a blood blister, about the size of a lead pencil end, developed and ruptured within a comparatively few hours, leaving a superficially eroded area which was still evident.

The patient has been seen at the Huntington Hospital where the condition was considered to be precancerous and a positive Wassermann was obtained. Since then four Wassermanns at various times and in various places have proved negative. The patient received six injections of salvarsan intravenously a year ago without any benefit at all to the tongue and the only medication that has afforded any relief is one exposure to radium. At no time has any eruption of the skin been noted by patient or by exhibitor.

5. NAEVUS VASCULARIS.

Presented by DR. OLIVER.

The patient has been shown at several previous meetings. The entire affected area has been exposed once to the Kromayer lamp and to radium. The improvement is especially noticeable around the eyes where the skin is thin and where she has had fairly short Kromayer treatments. All exposures have been fairly short.

6. RECURRENT (?) ROSEOLA OF SYPHILIS.

Presented by DR. C. M. SMITH.

The patient illustrates two points very well—the multiform character of the eruption and the lesions on the tonsil. There is no known source of infection, there is no history of a primary lesion and there is no adenitis. The outbreak appeared two to three weeks ago. Standing at a distance and looking at the back and chest there is sufficient amount of superficial drying and scaling of the skin to suggest some of the ordinary dermatoses. The color of the eruption is very much deeper than one would expect in an eruption of such a short duration.

The chief reason for presenting the patient lies in the rather unusual appearance of scaliness which in certain lights or in certain angles raises the remote possibility of pityriasis rosea. A second reason is the interesting family history. For four months the husband has been working in one town while the patient has been staying in another.

7. MULTIPLE CANCER OF SKIN.

Presented by DR. TOWLE.

The family history is negative. The lesion on the right buttock appeared forty years ago, gradually increasing in size, crusting and ulcerating. Lately it has become slightly sensitive. Twenty-five to thirty years ago a group of papules appeared below the right breast with persistent scaling. Twenty years ago a lesion was excised in the O.P.D., but recurred almost at once. A "water blister" appeared under the left lid twenty-one years ago, was diagnosed as epithelioma and treated with the x-ray, and has not recurred. Fifteen years ago a lesion appeared on the left scapula similar to that on the right breast. Two years ago a lesion appeared over the right clavicle, crusting and spreading, with very tender edges. A few weeks ago a small papule appeared at the crest of the right ilium accompanied by slight itching but no tenderness. On the right buttock there is an oblong lesion, seven by three and a half cm., with strikingly distinct corners, with necrotic, yellowish, slightly moist base of unhealthy granulations, with distinct, slightly raised cicatricial edges and narrow cicatricial margin. This area is very sensitive. Over the middle of the right clavicle is a lesion, six and a half by one cm., which has a smooth, cicatrized base, small sero-purulent crusts and slightly elevated edges. Below the right breast, about mid-way from the nipple to the mid-axillary line, there is an irregularly outlined, oval lesion, seven by three and one half cm., composed of slightly raised erythema with papules superimposed and small purulent and hemorrhagic crusts. This lesion is not sensitive. There is a similar lesion, five by three and a half cm., over the upper left scapula. Papulation is more distinct here and the erythema rather brighter. Just below the crest of the left ilium is a lesion similar to that described above. Near the umbilicus is a small, pea-sized, indurated, erythematous papule.

Biopsies from lesions on the right clavicle, right thorax and right buttock:

Microscopical examination of sections from the right buttock, and right clavicle shows small anastomosing columns of small undifferentiated cells of the basal-cell type in an abundant fibrous stroma. These lines present the typical character of epidermoid carcinoma of the rodent ulcer type. In the sections from the right trunk, although the epithelium does not show any deep invasion, it is, however, very atypical in appearance and must be regarded with suspicion. Epidermoid carcinoma.

Dr. Towle raised the question of treatment.

Dr. Burns replied that this type of epithelioma was suitable for excision and falls well within the class described by Dr. Bowen as precancerous dermatosis in view of its great chronicity and ultimate epithelial degeneration. The woman was originally a patient of Dr. J. C. White and Dr. Bowen. Dr. Burns had observed several patients exhibiting exactly the same appearance, chronicity and evolution.

Dr. Blaisdell inquired as to a possibly factitious element present, as a number of the lesions were squarish and others showed straight boundary lines.

Dr. Towle did not believe so and added that the tendency in the lesions was always toward hypertrophy with eventual breaking down into ulcerations. A factitious element might, however, have been the starting-point of the lesions.

Dr. White did not think that self-mutilation was present in the patient because the lesions were so scattered, were all in inaccessible places, and had lasted so long.

8. Erysipelas (?)

Presented by Dr. Towle.

Seven days ago the patient went to bed with a chill, pain in the right groin, slight nausea, no vomiting, and slept badly. The next day the temperature was 104°F. The patient states that she subsequently felt pain spread down the inside of the thigh. The inguinal glands were swollen. On the third day redness appeared in about the mid-thigh, which was also swollen and hot. Later still the erythema spread to the lower leg. There was no history of injury.

Physical examination is negative except that from the ankle to the knee the skin is bright red, hot, pitting on pressure, and without markedly distinct border. The affected area is tender, particularly over the mid-calf. There are large inguinal glands on the right side. Treatment: ice packs, forced fluids, crude coal tar.

Dr. Towle questioned the propriety of making in this case a diagnosis of erysipelas. The process started in the groin and went downward, whereas in his opinion erysipelas always spreads upwards. The typical sharply defined border was also absent. He was inclined to think that the process was connected more with the lymph than with the cellular tissue and therefore that diagnostically it was not a true erysipelas.

Dr. Oliver stated that he was under the impression that erysipelas could travel in any direction.

Dr. White spoke of examples of the disease in which he had noted progression both up and down a limb—the so-called wandering type.

9. Eczema Seborrhœicum of the Nose on a Syphlitic Soil.

Presented by Dr. Dix.

The patient developed syphilis five years ago and was treated in the Long Island Hospital and has continued treatment more or less since and is now on "mixed" treatment. Recently an eruption broke out on the face, especially about the nose and left temple, but has now faded out a good deal. There seem to be some white, characteristic lesions around the nasal openings, in the hair and also (one or two) on the chin.

Dr. Coues was interested to see this woman as her daughter, a well grown girl, was now a patient in the surgical clinic of the Boston Dispensary with the remains of two circular ulcerations over the tibia which had cleared up in a week's time under Ung. hydrarg.

Dr. Smith rather doubted the specific nature of the present lesion. He was perfectly sure that much of the eruption now present on the scalp and right cheek was not luetic.

10. Pityriasis Rosea (?)

Presented by Dr. Towle.

Three months ago the patient complained of sore teeth, sore throat and headache. A rash appeared on the abdomen and later covered the entire body. The patient consulted her physician and was given four injections of salvarsan at weekly intervals. The rash began to fade after the second injection. The patient showed about a dozen discrete maculopapular lesions, pinhead to dime-sized, in places somewhat annular, scaling particularly about the periphery, yellowish gray in the center. The scales were not loosened from the center.

The question arose as to whether the eruption was a seborrhoea, pityriasis rosea, or was due to salvarsan. Dr. Towle was inclined to the seborrhoeal theory.

11. Benign Cystic Epithelioma.

Presented by Dr. Burns.

The condition began in childhood, and the lesions have steadily and gradually grown in number and in size until today there are on the forehead, the left temple, the inter-eyebrow area, on the sides of the nose, and over the left malar region, single and grouped lesions, the size of a small pinhead to that of a good-sized pea. It seems as though one could follow the lesions from what would surely be called ordinarily a milium to the finished product, which is a glistening, whitish, smooth, dome-shaped, papulo-nodule. There is very little redness about them and there is no tendency toward angiomatous formation on their surface, so that a diagnosis of adenoma sebaceum seems doubtful. These lesions seem rather greasy and their greatest density is in each naso-labial fold. The man presents a striking picture. Biopsy made and the histologic diagnosis is benign cystic epithelioma. The lesions were first treated with radium but better results have since been obtained with fulguration.

12. Lymphangioma Tuberosum Multiplex.

Presented by Dr. Burns.

The disease has been present for four years on the feet and one and a half years on the hands. The lesions consist of papules, pea-sized to half an inch in diameter, bluish-red in color, arranged in annular form. There is neither stippling nor striation and the lesions are dome-shaped rather than flat-topped. Those on the feet, especially on the bottom, have fairly heavy scales from friction (?) and are more or less confluent. There has been no remission of lesions since the start and the patient has had no symptoms from them. It will be noted that the distribution of the lesions is distinctly unusual. The diagnosis has been confirmed by the microscope. As to treatment, Dr. Burns stated that incision followed by attempts at destruction with caustics or even fire does not always suffice to eradicate the process, but in a number of cases of lymphangioma radium has been quite successful.

13. Syphilis.

Presented by Dr. Smith.

In March, 1912, a penile sore was observed but was apparently not followed by skin or throat trouble or hair manifestations. This chancre appeared four days after coitus and there was no previous acknowledged exposure. In December, 1915, thickening of shins developed, accompanied by a scaly, papular eruption over the arms and legs, and interstitial keratitis was present. The Wassermann was negative.

On Feb. 8, 1916, the Wassermann was weakly positive. On Aug. 19, 1916, the lesions on the legs were typically rupial. From August to December four 0.4 doses of diarsenol were administered.

At present the man's physical examination is negative except for his skin condition and impaired resonance in the right lung. On the trunk and extremities there are numerous oyster-shell-like lesions, about twenty on each arm, from two to four cm. in diameter and there are numerous smaller ones on the legs, varying from two to twenty millimeters in diameter and from five to ten millimeters in height.

14. Lupus Erythematosus.

Presented by Dr. Oliver.

The patient shows numerous pea to dollar-sized areas of lupus erythematosus scattered over the greater part of his face. He has had much treatment, both public and private, including many freezings with CO_2 snow, none of which, although some were severe, have relieved the itching and irritation of the lesions.

The patient states that after the first treatment with the Kromayer lamp (two millimeters—blue quartz screen), lasting half an hour, he got complete relief from itching and irritation and since then many areas have been treated and the patient is very enthusiastic over the results of these treatments. The appearance of the lesion treated three months ago is very good; there is no scaling and the color is almost normal. On the patches more recently treated there is still some erythema but no scaling. A patch on the right cheek, treated four days ago, shows a flat, drying bulla. A lesion treated yesterday shows a flat, unruptured bulla. The ears have been treated with white light, at a distance of two inches, applied for about six minutes at a time and here also there is considerable improvement with lessening of scaling. The question is, is the improvement so far obtained to be permanent? Immediate results have been remarkably good.

15. Naevus Vascularis.

Presented by Dr. Oliver.

The child presents a naevus of the large cavernous type—great masses of vessels covering a large part of the right side of the forehead. When first seen she was sixteen months old and up to that time the right eye had never been opened, nor could it be opened, and her parents thought that there was no eye underneath. Two areas were frozen with CO_2 snow, twenty-five to thirty-five seconds each. Two months after this treatment the eye opened, and at the time of admission to the hospital (Feb. 7, 1917) the child showed an apparently normal eye with the lids separated half an inch and the swelling markedly decreased. At the present time the eye is closed, due to marked oedema from a freeze three days ago.

16. Naevus Pigmentosus.

Presented by Dr. Oliver.

The condition has existed since birth and, according to the patient, is increasing. She is now sixteen years old and shows innumerable, pin-head sized, hemorrhagic points on both lips, at the corners of the mouth, on the muco-cutaneous membrane and on the mucous membrane as well. Occasionally the lesions are confluent, the majority, however, are distinct. The general effect on the lips is that of a deep bluish tint superimposed on the normal red.

It is rather interesting to note that a few days previous to the birth of the patient her mother was sitting opposite a woman who was eating blueberries and asked for some, but was refused, and this refusal made quite a deep impression on the mother.

Charles J. White, *Secretary.*

NEW ENGLAND SOCIETY OF DERMATOLOGY AND SYPHILIS.

The eighth meeting of the Society was held at the Boston City Hospital on Tuesday, April 17th, 1917, with the President, Dr. Abner Post, in the chair.

The following cases were presented and discussed:

1. General Cutaneous Actinomycosis.

Presented by Dr. Boardman.

One month ago the man noticed a "sore" under the angle of the jaw. Two weeks ago a similar lesion developed on one finger, and the attending surgeon told the man he had paronychia. Today there are many large cutaneous nodules (up to the size of a hen's egg) noted on the trunk, arms, legs and scrotum and new lesions are appearing from day to day. No nodule has broken down, but incision has revealed yellow granules which microscopically have proved to be actinomycotic. Thorough examination with x-rays has failed to disclose a single internal focus of the disease.

The patient has recently been working in a diet kitchen, but up to 4½ years ago was a Greek agriculturist.

Dr. Boardman stated that a purely cutaneous infection of actinomycosis was almost unique.

2. Hemangioma of Palm.

Presented by Dr. Thorndike.

When first observed there was a purple-red, pea-sized, dome-shaped, sessile growth in the middle of the palm of five weeks' duration. The nodule was treated with radium and the lesion shriveled up and the crust fell off leaving practically no scar.

Dr. White asked Dr. Thorndike if he had considered the possibility of granuloma pyogenicum. Dr. Thorndike said "No," because of the bloody nature and profuse hemorrhage of the lesion.

3. Dermatitis Simulating Paget's Disease.

Presented by Dr. Thorndike.

The patient was forty-five years old, single, and still menstruating. When first seen the pathologic area had been present for three weeks and was limited to the left nipple and appeared as a unilateral, superficial, well-defined ulceration with crusts and a slightly indurated base; no itching, no surrounding eczematous condition. The patient has been under treatment for ten days and the ulceration has cleared up remarkably under Lassar's paste so that one must consider the condition merely as an excoriation with subsequent pyogenic infection.

4. Ringworm of the Scalp.

Presented by Dr. Oliver.

The patient, a twelve-year-old girl, developed ringworm of the scalp about five months previously. She was treated for a while with ointments and later the whole scalp was x-rayed, with resulting complete epilation. The hair has now grown again in a rather curious manner, for the affected areas have very much thicker hair than the other portions of the scalp.

Dr. Oliver thought that the increased blood supply due to the severity of the ringworm may have produced the localized increased growth of hair. Dr. Chace suggested that the x-ray did not penetrate so deeply in the affected areas on account of the scales and crusting. Dr. White felt that the increased growth of hair was possibly due to the application of external stimulating ointments to the affected areas before and after the x-ray treatment.

5. Ringworm.

Presented by Dr. Boardman.

The patient has been in this country three years and the process has existed two years, beginning on the right hand and later involving both feet. There is no history of contact with animals. Scrapings from the finger nails revealed ringworm spores and cultures have been grown. This type of ringworm is not so well known to the general practitioner as it should be and is usually diagnosticated as eczema. A cure under such conditions is well nigh impossible. Treatment in the present case has consisted of maceration followed by scraping and the subsequent application of an ointment containing 20% ammoniated mercury. A normal nail is now appearing on one finger.

6. Dermatitis Herpetiformis.

Presented by Dr. Oliver.

The disease has lasted six months and is now irregularly distributed over the face, especially the lower part, the clavicular regions, the neck, the arms, and somewhat on the lower extremities. The eruption is purely vesicular in type, usually grouped, and the areas vary in size from two to three vesicles a quarter of a centimeter in diameter to groups of vesicles two inches in diameter. Almost all areas have more or less surrounding erythema and many of them are confluent and show a distinct gyrate and annular tendency. The process does not itch, but a severe burning is present. Since the beginning there has been temporary improvement but never entire remission of the outbreak. There is no history of psychic shock in this woman of twenty-seven.

7. Ichthyosis.

Presented by Dr. Boardman.

A typical ichthyosis dating back to early childhood. When the patient came to the hospital there were marked eczematous changes, especially on the legs. Following treatment with salicylic acid and olive oil and thyroid extract there has been marked improvement. The pulse, however, was rapid at first.

Dr. White asked about the propriety of giving thyroid extract to a child with rapid pulse. Dr. Boardman replied that medical men were not opposed to giving the extract under such circumstances. Dr. Oliver said that he believed that the results one got from thyroid medication were due to stimulation of glands and that there was in these cases no natural deficiency of thyroid secretion. He expressed himself as very sceptical about any marked change in these cases following the use of thyroid. He considered that the pulse should be watched carefully during thyroid therapy.

8. Pemphigus of the Mouth.

Presented by Dr. Post.

The duration of the disease is sixteen months and the patient has never been free from lesions during this period. Sometimes there have been five or six bullae present but for much of the time only one or two. The lesions appear as blisters filled with clear or slightly necrotic fluid, last one week and break, leaving a red, very tender base. The mouth is particularly sensitive to acids. The teeth have been extracted on account of heart trouble rather than with a view to curing the mouth condition. The process is gradually growing worse and today there are lesions in the mouth, on the tongue, and on the inside of the cheeks.

9. White Negro.

Presented by Dr. Thorndike.

A very remarkable case. Ten years ago this totally black negro began to lose the pigment from his black skin and was first seen at the hospital two years later. He now shows complete loss of pigment. The only history given was that twenty-four hours after a cat scratch on the chest the pigment began to disappear and from that point has spread over the entire body. Dr. Thorndike, in the early days, tried to cause a loss of pigment by pricking an unaffected portion of the skin with a needle, but no depigmentation could be observed in consequence. Today, this hitherto black man stands free from pigment. Hair, eyes, skin and nails, all have shared in this extraordinary example of acquired albinism.

10. Syphilitic Periostitis.

Presented by Dr. Thorndike.

Seven months ago the patient began to have exceedingly painful osteocopic pains. Radiographs showed a typical periostitis with a certain amount of sclerosis. The Wassermann test was triple positive. The man has received mercury and salvarsan and the pains in the arms have improved, but those in the legs have not improved, and the patient is acquiring a gradual, but steady, interference with motion in the elbow joint, and now cannot straighten out his arms. Since the patient has been under treatment, there has been an increase of four or five per cent. in loss of extension. The tibiae also show periostitis.

Dr. Post said that he was very much interested in the case on account of its obstinacy, but he believed that treatment had not been exhausted until iodides had been tried. This inability to straighten the arms was a subject about which the older syphilologists talked more or less. It was supposed to be due, sometimes, to difficulty with the bones and sometimes to the effect on the muscles of the upper arm so that they lost some of their sensibility.

11. Lupus Vulgaris.

Presented by Dr. Oliver.

The patient, an Armenian man, had had the disease for seventeen years and had endured every imaginable treatment. Finally the disease had quieted down, but as the nose was almost wholly gone, a plastic operation was performed. This was a year ago, and now the patient returned with a recrudescence of the disease in the flap. What was to be done?

Dr. Oliver said that he would try the Kromayer lamp on some of the areas involved.

12. Syphilis and Jaundice.

Presented by Dr. Boardman.

Primary lesion, secondary rash, sore throat, and general glandular enlargement were present. The woman was given mercury for a week and then salvarsan. After the last injection three weeks ago, jaundice began to appear and the patient was treated at home for a week or two with general dietetic measures and mercury, and "606" was omitted. She was then admitted to the hospital where the liver was found to be enlarged with a pretty intense jaundice. The patient now feels much better. Mercury was again administered followed by an injection of "606" the day before yesterday. Jaundice is no worse, although it has not improved yet, but the liver is growing smaller. A previous deafness has grown worse during the present conditions.

13. Malignant Erysipelas.

Presented by Dr. Thorndike.

A case of erysipelas in an alcoholic woman which had been followed by necrosis and discharge of a large part of the pudenda and perineum. The affected area had been treated with chlorinated soda and allowed to slough off until granulation began to appear. The patient was then referred to the surgeon who had done a most successful plastic operation. Curiously enough the woman ran a normal temperature throughout the whole course of the disease.

14. Marked Venous Enlargement.

Presented by Dr. Boardman.

The man presented very great venous enlargement of the legs and trunk without obvious cause.

15. Precocious Syphilis.

Presented by Dr. Boardman.

The woman showed evidences of secondary syphilis, with general but proportionately very slight glandular enlargement. No primary lesion could be found. There were mucous patches in the throat, and very marked, almost rupial lesions in the scalp.

16. Lichen Planus.

Presented by Dr. Oliver.

The man presented a perfect embroidery of circinate lesions made up of fine, perfectly distinct papules, none of which averaged larger than the size of a pinhead, on the corona glandis, foreskin, inside the cheeks and on the palms.

17. Epithelioma of the Tongue.

Presented by Dr. Thorndike.

The patient was a woman. The growth started in the mouth near the frenum. There had been two operations, the last Nov. 8, 1916. Since then the growth has returned and now the whole tongue is involved.

Charles J. White, *Secretary.*

Book Reviews.

The Medical Clinics of Chicago, January, 1917. Philadelphia and London: W. B. Saunders Company.

In this number eleven clinicians take up a wide variety of topics. Of particular interest is an excellent summary of barium diagnosis by Dr. Case. A case of true amebic dysentery developing in Chicago is also briefly recorded The other discussions conform to the general plan of previous numbers.

An Index of Differential Diagnosis. Edited by Herbert French, M.A., M.D., Oxon., F.R.C.P. Lond. Second Edition. New York: Wm. Wood & Company. 1917.

This second edition of a well-known work on the differential diagnosis of main symptoms by various writers has been thoroughly revised and has several new articles added. The elaborate index has been made even more complete and the illustrations nearly double in number. There are now thirty-seven colored plates and over three hundred text cuts. The work is a useful reference manual of symptomatology and should continue its popularity with the medical profession. The symptoms are arranged alphabetically, from Accentuation of Heart Sounds to Yellow Vision. The contributors are twenty-three distinguished members of the British profession.

Diseases of the Stomach, Instestines and Pancreas. By Robert Coleman Kemp, M.D. Third edition, revised, with 438 illustrations. Philadelphia and London: W. B. Saunders Company. 1917.

The first edition of this book was reviewed in the issue of the Journal for September 1, 1910 (Vol. clxiii, p. 370). This third edition is enlarged by a new special section on the radiography of gastric ulcer, cancer, duodenal ulcer and gall-bladder disease; by a chapter on Lane's kink, Jackson's membrane, duodenal dilatation, and incompetency of the ileocecal valve; and by a section on sub-infection and protein absorption in the part on chronic intestinal putrefaction. Particular attention is devoted to abdominal ptosis and its mechanical treatment, though it seems that this aspect of the subject is made unnecessarily complex. Its importance, however, is not exaggerated. Other important additions to this volume are on hypochlorhydria and the treatment of obesity. The work should retain the position of usefulness prognosticated for it in our first review and successfully maintained by preceding editions.

Diseases of the Stomach. A Textbook for Students and Practitioners. By Max Einhorn, M.D., Professor of Medicine at the New York Post Graduate School and Visiting Physician at the German Hospital. Sixth revised and enlarged edition. New York: Wm. Wood & Company. 1917.

The first edition of this standard textbook for practitioners and students was favorably reviewed in the issue of the Journal for May 27, 1897 (Vol. cxxxvi, p. 524); the fourth edition, in the issue of January 3, 1907 (Vol. clvi, p. 19); and the fifth, in the issue of May 2, 1912 (Vol. clxvi, p. 672). This sixth edition, intended to keep the work abreast of the progress of gastric pathology, continues to fulfill the useful promise of its predecessors. The number of illustrations has been increased from 112 to 128. Since the publication of the original edition, the knowledge of stomach diseases has become much more generalized among the medical profession. The author's work represents his life experience in the subject, which has contributed in no small degree to its development as a specialty of scientific medicine.

The Basle Anatomical Nomenclature. By E. B. Jamieson, M.D., M.B., Ch.B. Edin. New York: Macmillan Company. 1916.

This monograph is a convenient compilation, in parallel columns, of an alphabetical list of terms showing the old anatomical terminology, the Basle anatomical nomenclature and the suggested English equivalent. In his introduction, the author describes the adoption of the B.N.A. terminology in 1895 and its subsequent gradual spread through the scientific world. Hitherto the chief obstacle to the universal employment of the B.N.A. in this country has been the lack of a satisfactory and accessible list of English equivalents and the unwillingness or inability of most American medical students to employ the Latin terminology correctly. This work by a Scottish anatomist supplies in convenient and accessible form this need of a standard English nomenclature of anatomy. It fills a very definite want in the teaching of this subject, and should prove a distinct aid in the ultimate establishment of a rational anatomic nomenclature.

A Compend of Human Physiology. By Albert P. Brubaker, A.M., M.D. Philadelphia: P. Blakiston's Son & Co. 1917.

This compend is intended for use by medical students and is probably a very fair representative of this fast disappearing type of medical literature. That a course in physiology should be so constituted as to be aided by the material here presented is fortunately increasingly inconceivable. As a summary of current physiology the book maintains the old anatomical viewpoint, a rather large amount of space being devoted to presentations of structure prior to every discussion of function. It can therefore be of assistance in only very elementary types of teaching or preparation. The fact that it is impossible to present physico-chemical material in canned form without rendering it inordinately difficult, spells the certain elimination of the compend in physiology, and this example, with its conspicuous absence of such material, can only go the eventual way of other members of the same class.

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ERNEST GREGORY, *Manager,*
126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE CAMP IDEA IN TUBERCULOSIS.

THE value of the open-air school, both in the winter and in the summer months, for either the poorly developed or the tubercular child, has been amply justified by the results reported in Boston and in Chicago, and wherever else it was tried. Similar results have been accomplished, in the reclamation of the child exposed to tuberculosis, in the preventoria maintained in many places. Not only have these children become well and strong, but their scholastic attainments have approached well within the standards of normal children. Whether the open-air treatment is administered to children in the open-air schools or in the preventoria, or to adults in day camps, it is the open-air treatment that holds the greatest hope for recovery. For the well-marked active case, whether in children or in adults, there is no other method of treatment but the outdoor method. During the active stages neither the child nor the adult can afford to engage in educative pursuits or in any occupation. But for the arrested case or for the child or adult that is on the mend, it is neither right nor desirable to withhold education or occupation. For the adult, suitable work prevents his ultimate pauperization and prevents him from being a burden to himself, his dependents, or to society. Otherwise his reclamation would be a mistake rather than a benefit. For the child, the absence of education during the formative period of his life would be to throw it hopelessly in the mentally backward class. It is to these classes that the day-camp idea is of the greatest benefit.

But unless the day camp is supplemented by the night camp, the value of this method of treatment must fail, for the patients must return to their homes at night, where conditions are the same as those which undoubtedly caused the original infection. These patients can again become sources of infection, and of greater degree than even much worse contact during the day. Moreover, the night camp would afford a place for the tubercular case that is allowed whole-day employment. None of the artificial open-air sleeping contrivances for use in the congested homes can quite equal the value of sleep entirely in the open air, under the same conditions as obtain in the day camps. This method of treatment for the arrested cases would prevent a great many of them from becoming reactivated after a short period of occupation, and would undoubtedly broaden the scope of occupations allowed these individuals. The night camp must be a graduation from the day camp, at least where both cannot be given. The ideal substitutes for the sanatorium climatic treatment, where this cannot be afforded, are the day and the night camps. Besides hurrying recovery and reducing the chances of secondary infections, the camp idea would afford more room for the well members of a tubercular family, in homes where room is usually at a premium.

THE ECONOMIC VALUES OF LIFE AND HEALTH.

NOT until the nation is made to face the enormous expense of maintaining the sick or of replacing the loss during warfare, does the money value of the individual and the loss entailed by his illness or death strike the public forcibly. Yet the money loss from sickness and death in civil life parallels that during war. Unless the figures are actually viewed and analyzed no adequate conception can be had. When once these figures are borne in mind, there can be no cost of study, research or of actual preventive measures that can quite equal the cost in money of disease or death from preventable disease. Moreover, besides the mere saving of life or the prevention of disease, measures looking toward prevention prolong the span of life many years. It is estimated that modern preventive measures now awaiting public approval, in the way of adequate funds, can increase the span of life more than fifteen years. Indeed, the gradual scientific developments since the Dark Ages have raised the span of life from an average of twelve years to nearly fifty years at the present time. Even now the deaths from preventable causes in the United States are estimated at much over half a million. From 20 to 50% of the children under one year die before the expiration of that period. While such diseases as typhoid and tuberculosis have been much reduced by modern preventive measures, the rise in the incidence of degenerative diseases, such as are justly attributed to alcohol, syphilis, and generally high-pressure life and overspeeding, has been very abrupt of late; and what has been gained in the reduction of acute infectious diseases and other disease conditions is much overbalanced by degenerative diseases. In the former it is the general public that is responsible for the rise or fall, according as they withhold or furnish coöperation in preventive measures, but in the latter the fault lies in the individual, who will not become educated to the proper mode of living.

Professor Irving Fisher of Yale University has aroused considerable interest in this general topic by his computation of the money values of life and health. He estimates the value of a new-born child at nearly $100. At twenty years, this infant's value is about $4000. The money loss from each postponable death is about $1700, and about 40% of all the deaths are postponable. The total money loss from preventable or postponable deaths is much over a billion dollars yearly. If the annual cost of illness is included, the loss annually is much over two billion dollars. The money value of the people of this nation—the human asset—is estimated at more than twice the value of the physical wealth. Nevertheless, in the conservation of the latter asset an infinitely larger proportion of the public money is expended than is so grudgingly bestowed upon the conservation of life and health.

GRADUATE WORK IN FRANCE.

A movement is on foot to restore to its true status French science and learning in America. For a generation past Germany has been the goal of the graduate student in search of further attainment in his chosen field and a degree in recognition of his study. That France has been equipped with equal educational facilities has not been taken into account, and few students have patronized her universities. The probable reason is found in the refusal of French Universities to open the majority of their courses to Americans and to confer on American students the desired degree. Within the few years past a committee was formed of Paris professors, instigated by a small band of American students, to endeavor to prevail upon the French Ministry of Education to remove these prohibitive regulations. They were successful to the extent that in all of the faculties of Paris, and possibly of all the fifteen other French universities, a French university degree is attainable by any qualified American student. His American degree (if from an institution of repute) will be accepted as equivalent to the corresponding French degree, qualifying him to become a candidate for the next higher degree.

It is now the endeavor of a society calling itself The Society for American Fellowships in French Universities, to bring to general attention the excellence of French institutions and their extensive facilities, and to foster in American students the desire to find in them the opportunity for further study, which they have been led to believe existed only in German universities. To this end, ten or more graduate fellowships are to be established for American students in French Universities, to be awarded competitively every year for ten years, beginning October, 1917; each fellowship to hold for two years, if desired. The Society has also published a book entitled "Science and Learning in France," aimed to set forth the status of French learning in the world of knowledge.

Following is a list of the Trustees of the Society as thus far formed:

New York, Charles A. Coffin (chairman of the General Electric Company), acting chairman; Henry S. Pritchett (president of the Carnegie Foundation for Teachers); Alexander C. Humphreys (president of the Stevens Institute of Technology); Dwight W. Morrow (of the firm of J. P. Morgan and Company); Thomas Thacher (president of the University Club of New York); Robert Bacon (former ambassador to France). Boston, Major Henry L. Higginson (of Lee, Higginson and Company, Bankers; member of the Harvard Corporation). Chicago, Charles L. Hutchinson (vice-president of the Corn Exchange National Bank; president of the Art Institute of Chicago); John V. Farwell (former president of the Commercial Club; member of the Yale Corporation). Cleveland, Myron T. Herrick (former ambassador to France). New Orleans, Charles P. Fenner (of the New Orleans Bar; Dean of the College of Law of Tulane University). St. Louis, Robert S. Brookings (president of the Board of Trustees of Washington University). St. Paul-Minneapolis, Charles W. Ames (president of the West Publishing Company).

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MEDICAL NOTES.

Mortality Rates in Japan.—The Department of Health of Tokyo, Japan, publishes the following statistics regarding its death rates for the year 1915. During that period there were 41,582 deaths, of which 21,403 were men and 20.159 were women. Tuberculosis caused the largest number of deaths—6635; diarrhea, 4206; pneumonia, 4206; Bright's and other forms of kidney disease, 2274; brain diseases, 2103; meningitis, 2714; and cancer, 1431.

New York Health Rates.—According to the annual report of the Department of Health of New York City, the year 1916 was the most healthful in its history, for, despite the infantile paralysis epidemic, the death rate was 13.89 per thousand inhabitants. Child mortality was reduced to 93 infants in every thousand, as compared with 125 in 1910. There was a decrease in births for the year of 3592, due, it is believed, to a cessation of immigration and the low marriage rate of the previous year. The marriage rate of 1916, however, increased by about 4000. There were 4235 deaths due to violence, many of them among children, and most of these preventable.

WAR NOTES.

Physicians for French Children.—A commission of pediatricians, under the leadership of Dr. J. P. Sedgwick of the University of Minnesota, will go to France to organize treatment of French children who are suffering from shell-shock and diseases resulting from lack of care during the war. The commission grew out of a conference of the American Pediatric Association with Herbert C. Hoover and physicians who worked with Mr. Hoover in Belgium.

War Honor for Boston Physician.—President Poincaré of France has conferred upon Dr. Ralph R. Fitch of Boston the distinction of being made knight of the Legion of Honor. This is in recognition of his work in the Franco-American Hospital at St. Valery en Caux, France. Dr. Fitch, who is a graduate of the Boston Latin School, received his degree of M.D. from the Harvard Medical School in 1903. After serving in the Massachusetts General Hospital and the Children's Hospital, Dr. Fitch associated himself with Dr. Weigel of Rochester, N. Y., well known for his work with x-ray. In December, 1914, Dr. Fitch offered his services to the Allies and was sent to a hospital at Yvetot, France. In August, 1915, he established a hospital at St. Valery en Caux, and became its head physician.

Amount of Red Cross War Fund.—It is reported that on July 16 the amount of the Red Cross War Fund had totalled $118,021,370. Of this amount, Massachusetts contributed $5,613,268; Maine, $604,898; New Hampshire, $375,341; Vermont, $162,000; Rhode Island, $896,923; and Connecticut, $2,633,622.

Recruiting of Motor Unit for France.—The Society of Automotive Engineers has planned to recruit a unit consisting of twenty truck drivers and ten mechanics with twenty helpers, for Red Cross service in France. All expenses will be provided, but recruits will be expected to serve without pay. The trucks will be used for transporting supplies from seaports to the devastated districts of France.

American Ambulance in Government Service.—The American Ambulance at Neuilly has been formally turned over to the United States Government to be used as a Red Cross Hospital. The ambulance committee will be replaced by an officer of the American Army, and the staff of surgeons and nurses will continue as before, if they choose to offer their services.

Arrival of Massachusetts General Hospital Unit.—It is reported that the United States Army base hospital No. 6, organized at the Massachusetts General Hospital, sailed secretly from Boston on July 9, and arrived safely on July 21 at a port in England.

War Relief Funds.—On July 21 the totals of the principal New England war relief funds reached the following amounts:

Secours National Fund	$321,465.22
French Wounded Fund	241,636.71
Armenian Fund	203,722.41
Permanent Blind Fund	119,503.50
Surgical Dressings Fund	111,366.00
Italian Fund	42,959.72

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending July 14, 1917, the number of deaths reported was 183, against 199 last year, with a rate of 12.36, against 13.65 last year. There were 35 deaths under one year of age, against 31 last year.

The number of cases of principal reportable diseases were: diphtheria, 53; scarlet fever, 23; measles, 93; whooping cough, 15; typhoid fever, 3; tuberculosis, 127.

Included in the above were the following cases of non-residents: diphtheria, 3; scarlet fever, 5; whooping cough, 1; typhoid fever, 1; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 1; measles, 3; typhoid fever, 1; tuberculosis, 24.

Included in the above were the following non-residents: diphtheria, 1; typhoid fever, 1; tuberculosis, 2.

Private Ward of the Massachusetts General Hospital.—The new and luxurious private ward at the Massachusetts General Hospital is in operation and is meeting with deserved approbation.

It is a building of eight stories and of fireproof construction throughout. It has accommodations for 102 patients. It is equipped with three general surgical operating rooms, an operating room especially designed for nose and throat cases, a large plaster room for orthopedic cases, and two clinical pathological laboratories. There are large balconies on the level of each floor and also a roof garden, to which patients' beds may be wheeled. Patients' rooms are connected with the electrocardiograph. There is a complete x-ray department in the building, which is under the direction of Dr. George W. Holmes.

The Trustees have decided to offer the use of this ward to a limited number of physicians not on the staff of the Hospital. They will be glad to extend the use of the ward for the treatment of cases of the same general character as the Massachusetts General Hospital has always accepted.

Boston Baby Hygiene Association.—At the July meeting of the Baby Hygiene Association the director submitted a report showing that during the past six months 1744 new babies were treated, which is an increase of 368, or 26.7%, for a corresponding period last year. With the usual increase in August and September, a weekly registration of 2500 babies may be expected before the end of the year.

Health Report of Worcester, Mass.—The recently issued annual report of the Worcester (Mass.) Board of Health states that its death rate for the year ended December 31, 1916, was 16.80 per thousand. Excluding deaths at both State Hospitals, it is 14.75, and excluding non-residents it is 13.80. The birth rate per thousand was 28.80.

Poliomyelitis in Haverhill and Groveland.—Five cases of poliomyelitis in Haverhill, Mass., and one in Groveland, Mass., make a total of sixteen cases of the disease reported in Massachusetts in June, 1917.

NEW ENGLAND NOTES.

Maine Health Commissioner.—Upon the organization of the health department of the State of Maine, based on the administration of Massachusetts and New York Departments of Health, Governor Milliken appointed Dr. Leverett D. Bristol of Boston as Health Commissioner. Dr. Bristol was born in Chicago, Ill., on June 2, 1880. He graduated from Wesleyan University in 1903 with the degree of S.B., and from Johns Hopkins University in 1907 with the degree of M.D. He subsequently became engaged in public health work in New York, Minnesota and North Dakota. About a year ago he entered the Harvard Medical School enrolling for the degree of Doctor of Public Health. During that time he has been doing research work for both the Massachusetts State Health Department and the Harvard Infantile Paralysis Commission. Dr. Bristol will take charge of reorganizing the health work of Maine as soon as his appointment is confirmed by the executive council.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT MEDICAL SOCIETIES.

Hampshire.—The regular meeting was held at Boyden's Restaurant, Northampton, July 11, 1917. Papers were read by Dr. E. E. Thomas on "Acidosis in Children"; and by Dr. O. W. Cobb of Easthampton on "Health in the Public Schools." The matter of the medical care of enlisted men's dependents, as advocated by the State Board of Health, was brought up by Dr. Miner of Ware, and referred to the committee on military affairs. Seven Fellows have already received commissions in the Medical Reserve Corps of the Army, and five others have made application.

Lt. J. D. Collins, Lt. W. J. Collins, and Lt.

J. F. Bowen are on active duty at Fort Benjamin Harrison, Indiana; Lt. H. B. Perry is stationed at Boston with the Department of the Northeast. Capt. E. C. Green, Lt. E. E. Thomas, and Lt. E. H. Hughes are awaiting orders.

E. E. Thomas, M.D.,
District Correspondent.

Obituaries.

EMIL von BEHRING.

On the day following the birth of Paul Ehrlich was born another illustrious German, Emil von Behring, and it is interesting to note that the present year ends both their careers. Dr. Behring was born at Hansdorf in West Prussia, on March 15, 1854. After qualifying in medicine at Berlin, he entered the Army Medical Corps, and in 1888 was made lecturer at the Army Medical College in Berlin. When he was thirty-five years of age he became assistant at Koch's Institute for Infectious Diseases and for the next five years he accomplished those achievements of research in immunity which have made his name known the world over. Of his work during this time the *Lancet* says:

"Working alone on diphtheria toxin and in association with Kitasato on tetanus toxin, 'the possibility of successfully treating cases of acute infectious disease' became the theme of a research published in the *Deut. med. Wochens.* in December, 1890, entitled 'Über das Zustandekommen der Diphtherie-Immunität und der Tetanus-Immunität bei Tieren.'' Clinical experience, accumulated largely by Heubner, confirmed these experimental results, and at an address on the Aims and Achievements of Serum-therapy at the Naturalists' Congress in Lübeck (1895) Behring was justified in saying: 'I have no fear that the thought which forms the basis of serum-therapy will ever disappear out of medicine.' He estimated the probable saving of 75 per cent. of the mortality from diphtheria in Germany, an annual credit of 45,000 human lives. For this work Behring shared with Roux the 25,000-fr. prize of the Paris Academy of Medicine and the 50,000-fr. prize of the Institute of France. In 1901 he received the Nobel prize for Medicine, and delivered an address in Stockholm on Serum-therapy, while his progress in the receipt of official recognition at home reached the highest level of Excellency in 1903."

In 1895, when he was forty-one years of age, he was appointed director of the Institute of Hygiene of Marburg and from this time on he achieved nothing further corresponding to the five years of successful scientific work at Berlin. He suffered from ill-health and from periods of depression. Becoming financially interested in the manufacture of antitoxic serum by the Farbwerke Höchst, he was given large and admirably equipped laboratories in which to work, where he conducted researches involving 7,000,000 ounces of tubercle cultures. His results with bovovaccine excited keen interest for a time, but do not appear to have survived the test of time and prolonged experience. Whatever the practical outcome of his experiments, he has had a profound influence on contemporary thought in regarding tuberculosis as a lifelong affection. He died from an attack of pneumonia on March 31, 1917.

WILHELM WINTERNITZ.

Wilhelm Winternitz, emeritus professor of medicine in the University of Vienna and called "the father of scientific hydrotherapy," died on February 22nd at the age of 82 years. The *Lancet*, in its obituary, says of him:

"From the time of his inaugural dissertation (1865) on 'The Rational Basis of Certain Hydrotherapeutic Measures' to the appearance, a few days before his death, of 'The Water-Cure and Natural Immunity,' Winternitz was constantly occupied in research on physical treatment. Many of his studies of the action of thermo-mechanical influences on the circulation and metabolism are now classical, as well as the long and bitter feud between himself and Liebermeister with regard to the bath treatment of infectious diseases. His idea of determining a blood-flux to particular organs and parts of the body was worked out in great detail long before Bier annexed the word 'hyperaemia.' Winternitz's belief in his own methods was very great, so that he imbued his patients with a like confidence, and he was for nearly half a century one of the busiest consultants in Vienna. But in spite of his great popularity he remained an inquirer and a research student to the last, intent on improving the field of medicine which he had so specially made his own."

OSWALDO CRUZ.

The premature death of Dr. Oswaldo Cruz in Rio de Janeiro has ended the career of the most eminent of South American hygienists. Upon his appointment as Director of Public Health of Rio de Janeiro, Dr. Cruz began a most drastic and fearless campaign to improve the sanitary condition of the city. He had demolished whole quarters of the city which were beyond repair and rigorously isolated all cases of infectious disease. At one time his measures nearly precipitated a revolution against the Government, but the successful issue of his efforts at length won his countrymen's confidence, and he was unhampered by political influence. He organized campaigns against mosquitoes and was untiring in devising measures for the safeguarding of human life. In three years' time he has eliminated yellow fever and plague from the city. In

1908 he began a war against malaria and smallpox and met with great success. In 1900 he founded an institute of bacteriology and serum therapy to which in 1908 the grateful citizens gave his name. This institution has become one of the finest institutes of parasitology in the world. There Cario Chagas discovered the cause of chronic infective thyroiditis and much other valuable research work has been done. The proceedings of the institute are issued each year in a volume printed in Portuguese and formerly in German, now in French.

Miscellany.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JUNE, 1917.

GENERAL PREVALENCE.

Over ten thousand (10,302) cases of communicable diseases were reported during June, a decrease of more than one thousand compared with the cases reported in May. During June, 1916, there were 7,514 cases reported.

The diseases that show an increase over the cases reported last month are typhoid fever, pulmonary tuberculosis, cerebrospinal meningitis and poliomyelitis. Features of special interest are noted concerning the following diseases.

Anthrax.—There were eight cases of anthrax reported during June, making a total of thirty-two cases for the first six months of this year, which is the largest number of cases ever reported in the state for a like period. Six of the thirty-two cases were fatal.

Six of the June cases were in persons who handled hides. Of these, two worked in the beam house or soak room of a tannery and four worked at unloading hides at the wharves or freight rooms, The two remaining cases were workers in a brush factory, and received their infection from the hair which they handled.

Cerebrospinal Meningitis.—A total of thirty-six cases for June is an increase over the usual number reported for this month; in the corresponding month of previous years, there were twenty-one cases in 1916, seventeen in 1915, and nineteen cases in 1914.

For the first six months of this year, there have been one hundred and twelve cases of this disease reported throughout the state. For the same period in 1916, there were eighty-eight cases reported. For several months this disease has been unusually prevalent in and about the cities of Boston, Pittsfield and Lowell. During June, Springfield and the adjoining city, Chicopee, also reported an unusually large number of cases.

Poliomyelitis.—This disease remains fairly well distributed throughout the state, eight communities reporting sixteen cases during the month. Haverhill, where five cases were reported, presented the only unusual incidence.

Diseases on the Premises of Milk Handlers.—During the month there were reported two cases of scarlet fever in families of milk handlers. Prompt action by the families concerned, who followed instructions of the local Boards of Health, prevented any spread of this disease to consumers.

EPIDEMICS AND OUTBREAKS.

Smallpox.—Ten cases of smallpox were reported during the month, four in Worcester, two in Shrewsbury, two in Fitchburg, and one each in Blackstone and Webster. With the exception of the Blackstone case, all apparently had their origin from the Worcester cases. The outbreak in Worcester, which reached its height in May, is now on the decline, and it is hoped that by next month this disease will be eliminated from the state. The source of infection of the Blackstone case is at present unknown, as the investigation has not been completed. There were two deaths among the ten cases; one had never been vaccinated, and the other was vaccinated in childhood, over fifty years ago.

Typhoid Fever.—Twenty-four cases of the one hundred and six cases of typhoid fever reported during June were from Fall River, where sporadic outbreaks of unknown origin occur from time to time. Suspicious groupings of a few cases of typhoid fever in both Chelsea and Everett during the current month led the local Boards of Health of those cities to carry out special investigations which, however, disclosed no common source of the disease.

Diphtheria.—The outbreak of diphtheria in Malden, which has been persistent for the past few months, is now on the decline as a result of extensive school culturing and the weeding out of children who were found to be harboring the bacillus of diphtheria in their noses and throats. There were twenty-seven cases reported during the month, which is quite a decrease compared with the previous months.

In Lowell, diphtheria is on the increase, fifty-nine cases being reported for June as compared with forty-seven reported during the preceding month. The cases are well scattered in all sections of the city, and no source has been found to account for the continued prevalence.

Cerebrospinal Meningitis.—An interesting neighborhood outbreak of this disease was reported from Beverly, where four cases occurred in the same house during June in four children aged 9 years, 7 years, 21 months and 3 months, respectively. A fifth case in a child five years of age, a playmate of the other children, was reported from a house across the street. This shows how the disease may be transmitted from one to another, and the necessity of carrying out precautions so that one child will not be the source of infection for others.

Scarlet Fever.—In Abington, an investigation following the report of eight cases of scarlet fever demonstrated that isolation was being carried out very imperfectly. Milk bottles were being left at the houses under quarantine and empty bottles collected. However, no evidence could be discovered to indicate that infection was carried through the milk. The cases were distributed throughout the town, and the probability is that the outbreak was due to unrecognized mild cases.

In North Easton, a family was found in which six out of eight children had scarlet fever before a physician was called. Conditions such as these result in seeding a community and causing an epidemic.

Food Poisoning.—Following a banquet held at a Boston hotel by pupils and teachers of a Quincy school, there were one hundred and seventy cases of food poisoning. Only four or five of those present were not affected. None of the cases was severe, although several of the pupils and teachers were absent from school for a few days after the banquet. The symptoms were chiefly gastro-intestinal, and there were no fatalities.

RARE DISEASES.

Actinomycosis was reported from Cambridge (1).

Anterior Poliomyelitis was reported from Cambridge (2), Worcester (3), Boston (2), Springfield (1), Amesbury (1), Sutton (1) and Haverhill (5).

Anthrax was reported from Peabody (1), Boston (5), Salem (1), Malden (1) and Winchester (1).

Cerebrospinal Meningitis was reported from Chelsea (2), Dracut (1), Templeton (1), Boston (6), Worcester (2), Gloucester (1), Pittsfield (6), Springfield (7), Watertown (1), Beverly (4), Palmer (1), Chicopee (1), Lawrence (1), Maynard (1) and Lowell (1).

Dog-bite was reported from Attleboro (3), Brockton (1), North Adams (1), Lawrence (1), Worcester (1), Lowell (1) and Salisbury (1).

Dysentery was reported from Wrentham (2), Worcester (1) and Boston (4).

Malaria was reported from Boston (5), Fall River (1), Dedham (3), Brockton (1), Brookline (1), Erving (4) and Montague (1).

Pellagra was reported from Lynn (1), Taunton (2), Chelsea (1), Danvers (1), Somerville (1) and Worcester (1).

Septic Sore Throat was reported from Boston (6), Newton (1), Belmont (1), Medford (1), Northbridge (1), Brookline (1) and Chelsea (1).

Smallpox was reported from Worcester (4), Webster (1), Shrewsbury (2), Fitchburg (2), and Blackstone (1).

Tetanus was reported from Worcester (1), Boston (1), Winchester (1) and Springfield (1).

Trachoma was reported from Chelsea (2), Lawrence (2), Salem (1) and Boston (2).

SAFEGUARDING FOODS AND DRUGS.

In the enforcement of the Food and Drugs Act during the last year, U. S. Department of Agriculture officials analyzed 29,833 samples of foods and drugs offered for interstate shipment and for import. A physical examination was made of samples from 76,468 shipments offered for import. Of these foreign shipments, 6,353 were found to violate the law in some respects and were either excluded from the country or admitted only after the importers had relabeled them to comply with the law. Of the samples of domestic products analyzed 3,535, either because of the nature of the product or because the label on it did not tell the truth, were found to be in violation of the Federal law. In 1,364 cases the Department recommended to the Department of Justice that criminal prosecution be instituted against the manufacturers or that the goods be seized. In many cases where there was no evidence of intention to defraud, and where there was merely some easily remedied flaw in the wording of a label, the shippers, after being warned in hearings, voluntarily took steps which made their products fully comply with the requirements. In all, there were held 8,715 such hearings, many of which resulted in the prosecutions indicated and the gathering of evidence for a large number of additional cases, which will be forwarded to the Department of Justice.

The Bureau of Chemistry, in its annual report, also calls attention to the fact that through the system of Service and Regulatory Announcements now in use, manufacturers are given due notice of the requirements and thus are enabled voluntarily to make their products conform to the law. In this way the government achieves its purpose, frequently without entering into needless and very expensive litigation.

In the regulatory work, special emphasis has been given to the control of drug products and foods liable to spoilage and pollution. These frequently constitute a serious menace to health. The food inspectors have been instructed to be particularly watchful for interstate shipments of bad eggs, milk, oysters, and spoiled canned goods, and false and fraudulently labeled medicines and spurious, synthetic drugs.

Attempts to counterfeit or adulterate imported drugs have been more common since the recent high price and scarcity of many of these products encouraged their imitation. It is interesting to note that of the 1,036 cases terminated in the courts during the year, 198 were brought on account of the false and fraudulent labeling of medicines. In all of these medical cases, save five, the courts found for the government, and this, it is believed, has exercised an important deterrent effect on the venders of nostrums shipped from one State to another.

The work of controlling the fraudulent labels of medicines and mineral waters has been greatly strengthened by the establishment of a separate office to deal with these matters. At the request of the Secretary of Agriculture an officer of the U. S. Public Health Service has been detailed to take charge of this work. Moreover, through the close coöperation established with the foods and drugs officials of many of the States, the Department was able to direct the attention of the local authorities to the presence of spurious drugs in their States and, as a result, many of these fraudulent goods in the hands of local dealers and beyond the reach of the Federal authorities were destroyed by State and municipal officers who, in many cases, prosecuted those responsible for the local traffic.

The coöperation in the sanitary control of the milk supply of small cities, described in the report for last year, has been extended in Illinois, Iowa, Missouri, Kansas, Nebraska, and in New England. It is proposed to repeat this work year after year, extending it each year to new territory. In some localities bad conditions were found, due in the main to insufficient cooling and careless handling. Perhaps the best result of this work has been that it stimulated some of the local authorities to take up similar work independently, so that definite permanent improvement of the milk supply of a number of cities has resulted. The coöperative work on the control of the shipment of decomposed eggs, described in the report of last year, has been extended to cover much of the territory in which shipments originate, so that eggs are now candled before shipment far more than formerly and the spoiled eggs destroyed or fed to poultry and stock. At the same time information given to local officials has helped them to curb local traffic in eggs rejected in candling.

The Bureau of Chemistry, after making coöperative sanitary surveys of oyster beds, issued warnings against the interstate shipment of oysters from polluted and doubtful beds and, where these warnings were not regarded, undertook prosecutions. As a result, interstate shipment from such territory was stopped.

The campaign against the sweating of immature oranges and immature grapefruit so as to give the immature fruit the color of ripe fruit has been successful, largely because of the active help of the greater part of the citrus-fruit producers. Comparatively few sweated, immature oranges were offered during the last year, and it is believed the better quality of fruit resulted in a steadier market, so that the producer as well as the consumer benefited.

Other forms of adulteration, not already mentioned, that received especial attention are the adulteration of scallops and canned tomatoes with water, the substitution of colored starch paste for tomato sauce, the reprocessing of spoiled canned goods, the traffic in cull beans, in decomposed tomato products, in rancid olive oil, in wormy horse beans, the substitution of foreign fat for cacao butter in, and the addition of cacao shells to, cacao products, the adulteration of rice bran with rice hulls, the coloring of inferior macaroni and of plain noodles, the misbranding of domestic macaroni in simulation of imported goods, and the adulteration of oats with water or weed seeds.

SYPHILIS IN THE AUSTRIAN ARMY.

"In a recent issue of the *Wiener Klinische Wochenschrift* (xxix, No. 51), Hecht, an Austrian army surgeon, states that in his corps records are now kept of every man with venereal disease, and a certain mark opposite the name of a man on the register indicates that in no circumstances is he to be granted home leave. This restriction of home leave had previously been enforced for typhoid carriers. Hecht adds that no one seems to class the venereal diseases with infectious diseases, but he is convinced that this neglect to apply the measures that have been found reliable with other infectious diseases will avenge itself sooner or later. He estimates that the number of syphilitics in the Austrian army now must certainly be several hundreds of thousands, and complains that they are being treated in hospitals, while sound and healthy men are being shot down in their stead. This actually places a premium on sexual infection, for the healthy have no chance of a few months' respite in the hospitals from the fighting. The effect likewise is to spare the syphilitics while the sound get killed off. He makes the very reasonable suggestion that the diagnosis should be the signal for sending the men to the front. This would have a deterrent effect; at present many prefer to take their chances with syphilis rather than with the enemy's shells. Hecht thinks it might be possible to form special companies of syphilitics as soon as the ulcers have healed over, so that the treatment could be conveniently continued and applied on the firing line, while infection of other troops would be prevented. Neisser long insisted that courses of salvarsan and mercury could be given perfectly well in the trenches. Hecht declares that it is impossible to reiterate too often the frightful danger for the populace from syphilitics in the primary phase. Since the war began, a total equivalent to sixty divisions have been temporarily withdrawn from the fighting for venereal diseases. In conclusion, Hecht insists on the necessity for enlightening the public in regard to the danger of venereal disease in candidates for matrimony."—From *Medical Officer*, London.

SAVING MOTHERS.

More women 15 to 45 years of age die from conditions connected with childbirth than from any disease except tuberculosis. About 15,000 deaths from maternal causes occur annually in the United States, and the available figures for this country show no decrease in the maternal death rate since 1900. Maternal deaths are largely preventable by proper care and skilled attendance.

These 15,000 deaths do not measure the full extent of the waste. They are merely a rough index of unmeasured preventable illness and suffering among mothers. Furthermore, certain diseases of early infancy are closely connected with the health of the baby's mother and the maternity care she has received, and these diseases cause about one-third of all the deaths occurring among babies under one year of age. More than 75,000 babies die each year from this group of diseases because they do not have a fair start in life.

The life and health of the mother are in every way important to the well-being of her children. Breast feeding through the greater part of the baby's first year is his chief protection from all diseases, and mothers are much more likely to be able to nurse their babies successfully if they receive proper care before, at, and after childbirth.

The expectant mother should at once consult a physician. She should remain under supervision so that any dangerous symptom may be discovered as soon as it appears. She should learn how to take care of herself, and she should have proper food and rest, and freedom from anxiety. When the baby is born, the mother needs trained attendance. A difficult maternity case is one of the gravest surgical emergencies. Many people do not seem to understand that in any case complications may arise which can be met safely by prompt and skillful scientific care, but which at the hands of an unskilled attendant may cost the life of mother or child, or both. Even after confinement, the mother needs continued supervision and rest until her strength has returned.

Thousands of mothers, both in city and country, do not have the essentials of safety, partly, perhaps chiefly, because they do not realize the dangers involved in lack of care or else accept the dangers as unavoidable. Many women are at present unable to obtain proper care, but when all women and their husbands understand its importance and demand it for every mother, physicians will furnish it, medical colleges will provide better obstetrical training for physicians, and communities will see to it that mothers are properly protected.

Little has been done as yet to show women that much of the waste of mothers' lives and health is unnecessary. Even less has been undertaken by communities to provide protection for them. Many communities which have studied their typhoid and tuberculosis death rates, and have undertaken costly measures to reduce them have been heedless of the death rates among mothers. It is not strange, therefore, that since 1900 the typhoid rate for the country as a whole has been cut in half, and the rate from tuberculosis has been markedly reduced, while the death rate from maternal causes has shown no demonstrable decrease.

Just how the importance of adequate maternity care is to be made plain to a community, and just how skilled care and instruction are to be made available for all mothers, are, of course, local questions, to be considered by each community. The prenatal clinics and prenatal nursing, which are being developed in many cities, suggest a method of supervision and instruction which might well be extended. Even in cities where such work is carried on and where good hospitals are numerous, the number of mothers reached is small in comparison with the number who bear their children without adequate care.

Difficulties are perhaps greatest in rural districts where the sheer inaccessibility of a physician is often added to the other elements of the problem. Here a public nursing service, with headquarters at the county seat, or other accessible town, would probably be the first step, placing at the service of every expectant mother a visiting nurse, who is especially equipped to give her information about personal care and to watch for symptoms of trouble demanding medical advice. As such a nursing service develops, its headquarters might become, with the cooperation of physicians, a sort of maternal and child-welfare center, to which not only prospective mothers, but also mothers with babies, could come for instruction, examination, and advice. If no general hospital were conveniently near, a cottage hospital for mothers and babies might ultimately form a part of such a center.

A more general use of existing provisions for scientific maternity care, and the extension of provisions for such care in all types of communities, should serve to reduce the number of deaths among mothers and babies, and to improve the health and general condition of children throughout the country. A full discussion of the causes and prevention of maternal deaths and an analysis of available statistics, are contained in a report on Maternity Mortality, published by the Children's Bureau.

The Children's Bureau has several publications which are of interest in connection with work for the welfare of mothers and babies. A list of these publications will be sent upon application to the Children's Bureau, Washington, D. C.

Correspondence.

TUBERCULOSIS IN THE ARMY.

San Francisco, Cal., July 12, 1917.

Mr. Editor:—

In your issue of July 5th is an editorial on tuberculosis in the army, in which you call attention to the plan for "volunteer services of experienced physicians" needed in eliminating "active or obvious pulmonary tuberculosis." You call attention to the value to the army in effectiveness in preventing such cases from enlisting or being drafted, and point out that incipient cases may be safely placed at useful civil work.

All that you say is true, and it is a very worthy service that physicians skilled in detection of early pulmonary tuberculosis may render by making possible the segregating of such cases. *But* there is a big side of the whole problem—perhaps its most important side—to which you make no reference, and that concerns what is the nation's, the state's, the municipality's and the physician's duty to these uncovered cases of tuberculosis. What are we going to do with them and for them? Surely it is wrong to cast these men aside, discouraged and confused by the too often unsuspected information that they have "consumption." The examining officers are frequently to blame for the way such facts are presented to such unfortunates and it is possible that the tragedy of yesterday in San Francisco, wherein a young man who had served on the Mexican border sought enrollment and was thrown out on account of a lung condition, took poison, might have been avoided and a handicapped individual made to serve happily some function for his country.

Is it not time that the medical profession united on some plan for coördinating all the possible forces available for the care of these uncovered cases of tuberculosis, and thereby turn to advantage the possibilities for good in this tuberculosis survey of 600,000 of our young men? For a year and a half some of us have advocated the passage by Congress of a bill, known as the Kent Bill, providing for a Bureau of Tuberculosis in the Public Health Service and for the care of indigent non-resident consumptives through a subsidy or the returning of such patients to their home towns, provided they could be cared for there. The bill brought out some opposition from just the source least expected—a few social workers who feared that it would increase migration of consumptives. The discussion of the subject may be found in the *Survey* of July 29, 1916, *The Journal of the American Medical Association*, Aug. 5, 1916, and in the *Journal of the Outdoor Life*, July, 1917.

The whole point of the matter, however, is that the federal government alone may regulate interstate traffic and exercise the power to prevent migration and control the travel of consumptives. If the Kent Bill were a law today, we could provide at once for the wanderers who are being buffeted about from town to town and the same government machinery that had in charge the thirty to forty thousand such cases could handle wisely the new cases which the army examination will bring to light. Not that these cases should be classed with the wandering indigents by any means, but with a nation-wide machine for determining the existence and extent of the disease among drafted men and a full knowledge of each community's resources for the care of pulmonary tuberculous cases, an immense advantage would be gained by starting these men on the safe road, instead of casting them adrift with a staggering blow, calculated only to increase the tragic effect of the unexpected situation.

California has met this approaching situation by appropriating at once $100,000 for the purchase of a property admirably calculated to be used at once for the care of its prospective soldiers, rejected because of the discovery of tubercular lung lesions. It seems only fair that each state should make some such provision and that the federal government should help to support this work. A good many cases not active at entrance examination are going to become so later and there should be adequate provision for immediate efficient care. Why cannot Massachusetts, which usually is in the lead in such matters, start at once to do its own duty thoroughly and help to bring about the coöperation of the central government in this most important work?

Philip King Brown.

RECENT DEATHS.

James Dwight, M.D., of Boston, died at his summer home at Mattapoisett, on July 13. He was born in 1852, the son of Thomas Dwight and Mary C. Dwight. Dr. Dwight achieved world-wide distinction as a tennis player, and for many years had labored in the interests of the game. As president of the United States National Lawn Tennis Association, he was instrumental in raising the game to its present high standard. In 1886 he wrote and produced the first American book on tennis. He was a skillful player and in the history of the game became an efficient and faithful leader. Dr. Dwight is survived by his widow, two sons and three daughters.

James Ambrose Jones, M.D., a Fellow of the Massachusetts Medical Society, died at his home in Lynn, July 4, 1917. He was a graduate of the University of Vermont in the Class of 1906, and joined the Massachusetts Medical Society in 1908. He was 53 years old.

Edwin Nelson Mayberry, M.D., died at South Weymouth, July 14, 1917, aged 60 years. He was a graduate of the University of Vermont School of Medicine in 1882 and settled in South Weymouth in 1889, when he joined the Massachusetts Medical Society. He was president of the Norfolk South District Medical Society in 1911-12 and since then had been a councillor.

Dr. Grantley Bickell, a prominent veterinary surgeon of Haverhill, Mass., died at his home on July 9. Dr. Bickell was born in 1872. He was a member of the State Bureau of Animal Industry and was active in the recent campaign throughout New England against foot and mouth disease.

The Boston Medical and Surgical Journal

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The Massachusetts Medical Society.

MEETING OF THE SECTION OF TUBERCULOSIS, JUNE 12, 1917.

WHEN IS THE DIAGNOSIS OF TUBERCULOSIS WITHOUT POSITIVE SPUTUM JUSTIFIED?

BY DAVID R. LYMAN, M.D., WALLINGFORD, CONN.,

Superintendent, Gaylord Farm Sanatorium; Member Connecticut Tuberculosis Commission.

THIRTY-FIVE years ago the discovery of the tubercle bacillus fired the world with the hope that the cure for consumption would soon be found. Today, after exhausting our ingenuity in producing sera and vaccines, and after having experimented with almost every drug in the pharmacopeia in turn, we stand, as regards the treatment of tuberculosis, just where we stood then. We know that the hygienic-dietetic régime, whether carried out in a sanatorium or at home, will give us excellent immediate results, provided we can get our cases in the early stages. The years have but served to intensify the insistent demand for an early diagnosis of tuberculosis, but I regret to say that they have not brought the response to this demand which we had a right to expect.

The greatest stumbling-block in our way has been the evasive tubercle bacillus itself. One is so sure of his ground when the microscope reveals this, and there can be so many flaws suggested as to one's diagnosis when it does not! And yet, if we want an early diagnosis—as we all agree we do—it becomes necessary for us practically to disregard the absence of the bacillus in reaching our conclusions, or at least to grant that its presence in the sputum is not needed for a correct diagnosis. We must always remember that tubercle bacilli are found in the sputum only after there has been caseation and destruction of tissue in the lung, and where, speaking strictly, the disease can no longer be regarded as truly incipient.

In considering when a diagnosis without positive sputum is justified, it might be well to try to arrive at some idea of how often the diagnosis must be so made. With this in view, I have gone over the laboratory records of 1638 cases discharged from Gaylord Farm in the past twelve years. These show 1076 in which the sputum was positive, and 562, or just over one-third, with no bacilli. I do not claim that these figures give accurately the incidence of tuberculosis without positive sputum, for I know that in some of them the question of final diagnosis would be difficult to establish. The proportion would, however, be but small. In the first place, the 562 negative cases, instead of being all, or even chiefly, "incipient" or "suspects," were divided as follows: incipient, 244; moderately advanced, 297; far advanced, 21; more than half showing well-developed lung signs. The probability of correct diagnosis in the series is further strengthened by the fact that in 51 cases there was tuberculosis elsewhere; 18 had pleurisy with effusion; 126 had hemorrhage, and these included only frank hemorrhage, and not blood-streaked sputum; 97 gave positive tuberculin reactions to doses ranging from 1 to 7 mg. of old tuberculin given subcutaneously, and 76 died from tuberculosis after discharge. We thus have the diagnosis confirmed in 368 of our 562 cases. When we take into consideration the fact that the large majority of these cases had been diagnosed by their own physicians or a consultant before coming to us, it would seem that we were entitled to claim a fair degree of accuracy for the diagnosis, even though one-third of all our cases showed negative sputum.

The study of the records of those having positive findings emphasizes again the futility of depending on sputum for diagnosis. I would say that our laboratory routine has been to make daily examinations for at least a week in all cases with negative sputum, and to re-examine monthly in all cases. We had 1076 cases with positive sputum. In 213 of these the sputum was negative occasionally; in 56 it was negative as often as positive; in 42 negative twice for each positive finding; in 63 negative three times for each positive finding; in 70 negative five times; and in 39 negative ten times for each positive finding!

We thus have of our 1076 positive cases, 483 whose sputum at times would have failed to support our diagnosis, and of our series of 1638 cases only 593 whose sputum was positive at *all* examinations. Please bear in mind that these cases are classified approximately one-half as "moderately advanced," one-fourth "far advanced," and one-fourth "incipient," and you will readily see how very important it is for us to cease giving too great prominence to negative sputum findings if we are to make any advance in our early diagnosis of this disease. I do not mean by this that we should simply disregard *one* negative examination, but that if the history, symptoms and signs point to tuberculosis, we should make our diagnosis in the face of *persistent* negative sputum. In one case in our series, the bacilli were found at the 38th examination, and in several there were over twenty negative results before they appeared. In 172 cases the sputum was negative from three to ten times for every positive result. With only 593 out of 1638 cases showing constantly positive sputum, it is evident that a negative sputum is not sufficient ground for excluding tuberculosis.

What are the conditions under which we are justified in making a diagnosis of pulmonary tuberculosis in the face of negative sputum findings? The data necessary for this purpose may be gathered: first, from the history of the case; second, from the symptoms presented; and, third, from the physical signs.

First, History. Few practitioners seem to realize the supreme importance of an accurate history, both as to person and family, in tuberculosis. It is at once the best guide to a correct diagnosis, and the most difficult to obtain. When we realize that tuberculosis is a disease of childhood, often lying latent for long periods, to reawaken under the strain of adult life, we begin to see how direct a bearing the past history of the individual has upon his present condition.

Family History. The importance of the family history is generally conceded, and yet it is taken in the most casual way, even in most institutions. It is not enough to ask whether father, mother, sisters, brothers, etc., had tuberculosis. You must remember that tuberculosis very often passes undiagnosed, and in cases where you are in doubt, you must question very closely as to the presence of chronic cough, bronchitis, asthma, catarrh of the lungs or hemorrhage, as well as fistula, and other forms of tuberculosis among the family group. Also bear in mind that the importance of any such history is in exact ratio with the extent to which your patient was associated in childhood with the relatives so affected. The question as to whether anyone with a chronic cough lived at home when the patient was a child, often elicits definite history of exposure through some friend of the family or connection who would not have been thought of under the usual line of questioning. The family history is, of course, insufficient in itself for a diagnosis, but he is a very brave (or foolish) physician who will assure the patient that he absolutely has no tuberculosis, in the face of a strong family history or a definite history of exposure in childhood.

Personal History. The life history of the patient should be thoroughly gone into, with especial attention to previous illness. And again, let me caution against too casual questioning. It does not help your practice to have your patients sent back from a sanatorium as non-tuberculous because (as in one case under my observation) the hemorrhage on which you based your diagnosis proved, on questioning, to be no more than streaked sputum following a nosebleed.

It is common for tuberculosis to present frequent, though slight relapses, and a careful past history often explains present conditions. History of persistent, enlarged cervical or axillary glands, or of fistula in ano, or other tuberculous foci are, of course, of prime importance. Next to these the story of previous acute pleurisies is the most significant. Primary pleurisies always imply tuberculosis unless you can definitely prove them otherwise. Being "subject to colds" is another suggestive story. Usually the patient states that he has had "bronchial catarrh" or "grippe" every winter, with a cough which "hung on." Be chary of joining with the patient in placidly accepting these diagnoses! Of much value also is the history of having been frequently "run down" and having had to go to the country for a month or two every few years.

A history of "malaria" always requires careful analysis. This has been for years the favorite standby of the careless diagnostician, and more cases of tuberculosis have been kept in false security until too late for treatment by the diagnosis of "malaria" than in any other manner. Careful questioning often reveals the absence of any fever and ague or of any definite periodicity of the attacks, leaving a story of periods of loss of weight and strength, slight fever and malaise recurring almost yearly and connecting most logically with the present signs and symptoms.

Hemorrhage from the lungs always means tuberculosis (except when due to carcinoma or cardiac disease), and you may feel sure of giving your patient his best chance if you base your diagnosis on it even without other signs or symptoms. This has been stated so often that it would seem needless repetition. I am, however, constantly seeing cases with a history of hemorrhage one or two years previously which the physician has failed to recognize until advanced disease developed, because he did not know that the hemorrhage itself was • ample ground on which to base his diagnosis.

Second, Symptoms. The chain of symptoms which are of greatest importance in diagnosing early tuberculosis are: persistently rapid pulse, afternoon or evening rise of temperature, loss of weight, loss of strength, and persistent cough. It seems hardly necessary to go into details as to the presence of these and their value. In the persistence of any two of these without explainable cause, tuberculosis must be considered. Where the diagnosis rests almost entirely on symptoms the physician must be very careful to exclude other common causes, especially if there be a positive family history to give a background for the diagnosis. One must remember that overwork and dissipation produce loss of weight and strength; that chlorosis, hyperthyroidism and neurotic conditions may show the rapid pulse; that women at the menstrual period often show a similar rise of temperature, as well as of pulse; that malaria may be responsible for such a chain of symptoms; and that there is such a disease as syphilis. Latent syphilis is difficult to detect, and Wassermanns are not readily obtainable in private practice. In doing routine Wassermanns on our patients for the last two years, Dr. Ford found between 5 and 6% showing a reaction of three or four plus, which plainly shows the necessity of keeping this complication in mind.

If only the physician would realize the value of accurate records of temperature and pulse in his doubtful cases, we should not stand as a profession under the indictment of ignorance concerning the chief disease to which mankind is subject; but when out of 1940 physicians consulted by the last 1000 of our patients only 13.4% saw fit to take the temperature even once, we must admit that we give the public just cause for criticism. The patient should be taught to keep a record at least *ev. 4 h.* for a week, and the doctor should realize that persistent or frequent afternoon or evening rises to 99.5 or over are strong evidence of the existence of tubercle, unless he can otherwise explain their presence to his own entire satisfaction.

Third, Physical Signs. The physical signs of early tuberculosis are usually very slight, too slight to give in themselves a basis for final diagnosis, and a positive diagnosis should often be made when there are no signs present in the chest. It is not at all rare to see hemorrhages in patients whose chests are apparently clear, or to find tubercle bacilli in the sputum from such a case. We must remember that one can get bacilli and even hemorrhages from a very small focus, and that the lung is a deep-seated organ and covered with tissues such as bone, fat, skin, and muscle, each with a different capacity for transmission of sound. As a result it is not only possible for tuberculosis to exist undetected in the deeper portions of the lung, but, as all of us who have done much lung work know to our sorrow, it is possible for fairly large cavities to be situated in the upper lobes of the lung and yet give no sign on examination even in expert hands. Modern methods of physical diagnosis are not sufficiently accurate to justify our stating dogmatically that a chest is clear if the history or symptoms are at all suggestive of tuberculosis. It is the location and persistence of the sounds rather than their character which must be our guide as to their probable tuberculous origin. All inflammatory conditions of the lung—whether due to infection or chemical or mechanical irritants—produce the signs of bronchitis. In grippe or in bronchitis following a catarrhal cold, or due to dusts or other irritants, these signs are scattered generally throughout both sides. In tuberculosis, on the contrary, the invasion, instead of being general, is along the lymphatic system supplying a lobe or a lobule or group of lobules, and the resulting bronchitis is localized. Persistent signs of localized bronchitis or persistent local impairment of note and breath sounds are to be considered as tuberculous when appearing in the apices of either the upper or lower lobes. On the other hand, the x-ray has shown us that tuberculosis rarely is present in the lower lobes alone; and that most of those cases showing marked impairment of note and breathing, with coarse râles over the right or left lower lobe, with the remainder of the chest clear, are probably due to non-tuberculous infections.

In determining the nature of a lung lesion, the history is of the greatest value. A local bronchitis, found with a history of a recent grippe or pneumonia, requires to be kept under observation for diagnosis. When there has been no history of recent acute respiratory trouble, the diagnosis of tuberculosis is usually correct; and if the case gives a history of exposure and at least two of the cardinal symptoms of tuberculosis (rapid pulse, afternoon temperature, loss of weight, malaise, chronic cough), a positive diagnosis should be made regardless of even the presence or absence of sputum.

It is necessary, however, to make the distinction between clinical and pathological tuberculosis. If during an examination for insurance or other purposes you find a slight dullness with impaired breathing and even slight moisture after cough at one apex, there is no need to make an invalid of the patient provided he has no symptoms. It is sufficient to tell him that there is latent trouble present and to advise him to have his chest examined periodically, to be sure he does not show signs of spreading.

The final diagnosis of incipient pulmonary tuberculosis is one of the most difficult tasks which confront the general practitioner. It requires careful history, a temperature and pulse record taken at least every four hours for several days, repeated chest examinations and often the use of tuberculin test and the x-ray to find or exclude tuberculosis. The sputum also should be examined daily for at least a week. That all this is difficult to obtain in private practice does not absolve the general practitioner from his responsibility. With signs and symptoms suggesting tuberculosis it is his duty to see that the case is carried through to a final diagnosis, and he should certainly not fail (for his own protection if for no other reason) to advise the patient of the necessity for such a final diagnosis.

If unable to make a diagnosis that would satisfy you as to your own case, you should send the patient to a hospital or sanatorium where such diagnosis can be made. It would add to his regard for you and often mean life itself for him. I feel strongly that the rules governing admission of patients to our state and municipal sanatoria should be so drawn as to provide for the admission there of cases for diagnosis. The physicians would then have a place available where they could secure the temperature and pulse records, animal inoculations, tuberculin tests, x-ray and repeated physical examinations, all of which are often necessary for the diagnosis of incipient pulmonary tuberculosis.

Where such facilities are not available the physician can do no better than follow the teachings of that great physician of a former generation, Dr. Henry I. Bowditch: "If with the history of abnormal symptoms lasting for a longer or shorter space of time, upon examination you find anything out of the normal at one or the other apex, watch your patient closely, for the chances are that there is or has been tubercular trouble there."

I am sorry to say that the profession, as a whole, does not begin to realize the need of altering its attitude toward the diagnosis of tuberculosis. There is no question that the sanatorium men, working as we do always along one line, make many mistakes on the side of diagnosing tuberculosis in doubtful cases, when it does not exist, but we have learned in recent years to subject such cases to searching study after they enter the sanatorium before we charge a positive diagnosis up against them. Bear in mind, however, that such mistakes are made on the side of safety and result in the patient taking a much-needed rest, rebuilding his general health and acquiring much valuable knowledge as to personal and public hygiene. Erring on this side, we do but little harm and considerable incidental good. Many of the general practitioners persist in following the opposite course, and in so doing, work infinite harm to their patients, to themselves, and to the profession. There is never a time when an incipient case cannot find admission to our sanatorium with but brief delay. There is rarely a time when an advanced case can find such relief save after a wait of several weeks. When such cases come with a history of having been treated for bronchitis or malaria or catarrh, often for one or two years; when they have consulted their physician faithfully and relied on him implicitly and then find that they have advanced and incurable tuberculosis, do you wonder that they and their friends are bitter against us? The history of the diagnosis of our last one thousand cases at Gaylord Farm, showed that they had consulted 1940 physicians before coming to us. Of these 10 2-10% made no examination or test of any kind, but merely prescribed and collected their fee. Do you wonder, under such conditions, that the public holds us to blame for the failure of the campaign to secure early diagnosis of tuberculosis? Our attitude towards this most common of all diseases has done more to promote the sale of patent medicines and the prosperity of the chiropractor and kindred cults than any other influence. We shall not alter this until we begin to give our patients the benefit of the doubt and make our diagnoses without waiting for the positive sputum of more advanced disease. I have no patience with the growing tendency to chide the busy physician because he has diagnosed as tuberculosis some case of streptothricosis or other chronic lung disease. I only wish the general practitioner were less afraid of making such errors, for then he would abandon the Micawber-like attitude with which he watches the gradual development of chronic chest lesions. There is no more excuse for letting the average case of pulmonary tuberculosis reach an advanced stage without correct diagnosis, than there is for waiting for rupture and ensuing peritonitis before diagnosing appendicitis, but fortunately for the human race there is no specific germ associated with appendicitis.

Diagnosis of Tuberculosis in Children.

By Henry D. Chadwick, M.D., Westfield, Mass.,
and
Roy Morgan, M.D., Westfield, Mass.

Only a few years ago tuberculosis was thought to be a disease of early adult life. Now we realize that it must be considered as a serious menace in childhood. Because it is usually a chronic and not an acute disease like measles and scarlet fever, it did not attract so much attention.

A study of the death rate from tuberculosis at different age periods shows these significant facts: The death rate of children under five is 127 per 100,000; for the next decade it drops to 36 and then steadily increases between fifteen to nineteen years to 115, and thereafter rises steadily until it reaches its maximum of 228 at the age period of thirty-five to forty-four.

In a general way the course of the disease has three distinct phases, according to the age of the patient: general, glandular and pulmonary. In infants and very young children it seems to run the course of an acute general infection with very little tendency to localize, and death usually follows from meningitis and miliary tuberculosis. For the age period between five and fifteen years, tuberculosis seems to be a localized glandular disease. Resistance to invasion, or the power of the tissue to react in the presence of tubercle bacilli, has been acquired since infancy and the course of the disease is radically different. The bacilli become walled off more or less effectively by a growth of fibrous tissue. The bacilli, therefore, do not have the chance to multiply and spread throughout the body. They lodge in the lymphatic glands and only occasionally reach the bones. Enlarged glands or swelling of the joints are the immediate results. The symptoms vary with the location of the focus of disease and this stage of tuberculosis is of a chronic type. It might well be called the incubation period for what so often follows. From fifteen to forty-five years of age, pulmonary disease is the usual form. We have reason to believe that the lungs become affected by the spread of the bacilli from broken-down tubercle in the bronchial glands. A new infection from external sources among adults is probably rare. Tuberculin tests show that from 50% to 70% of all children are infected with tuberculosis before they are fifteen years old, and in the city-dwellers the infection is almost universal. Where resistance is good the infection may not produce apparent symptoms. In fact, in the greater number of infected children the bacilli are buried so thoroughly in fibrous tissue that they never produce disease. If this were not so the death rate from tuberculosis of one in ten would be decidedly greater.

These preliminary observations are made because the diagnosis of tuberculosis in children must be based on an understanding of the pathology of the disease. The symptoms of tuberculosis in children, with its tendency to be of a glandular type, must necessarily be different from the symptoms in pulmonary disease of the adult. The diagnosis of early tuberculosis in the child requires a different point of view. The emphasis must be laid on the evidence of toxemia produced by tuberculin. It is the case where the child is passing from the quiescent condition of infection to the stage of disease that we are considering. This, in fact, is the true incipient stage of tuberculosis. It is only in advanced disease that pulmonary symptoms are pronounced.

The symptoms of an overdose of tuberculin are malaise, exhaustion, a rise in temperature; and vague pains in different parts of the body are common.

The child with incipient tuberculosis is easily fatigued, cannot keep pace with the normal child in play or school. When they make the attempt they soon become tired out. They are less energetic in all their activities and it takes them longer to recuperate. They often are nervous and irritable. The normal child may go to bed thoroughly tired, but will be completely rested and as fresh and active as ever in the morning. Children with developing tubercle, however, are much exhausted after less exertion and they will wake up tired and languid. If they continue in school or their exercise is not restricted, a low grade of fever will develop. This will be discovered only when the temperature is taken in the afternoon. It is often variable and transitory. Lack of appetite for breakfast is significant of tuberculosis. Both in children and in adults we have found this statement true. A healthy child is always hungry and ready for meals. Loss of weight or failure to gain is a frequent condition in early tuberculosis.

We have then these common, constitutional symptoms of active tubercle, namely: malaise or weakness, loss of weight or failure to gain, and fever. They are all caused by the absorption of tuberculin and are present in tuberculous disease, regardless of whether the focus is in the chest, lymphatic glands elsewhere or in the bones. The thoracic glands are the most frequently affected and are the ones we are now considering.

Local symptoms are cough, hoarseness, dyspnoea or shortness of breath and hemoptysis. They are produced by the pressure of the large congested glands on the neighboring structures. The sputum which is raised, occasionally contains streaks of blood and comes from the tissues about the tuberculous focus.

To obtain data helpful in diagnosis we analyzed the histories of nearly two hundred children that have been in our care at the sanatorium. The family history was positive in 66%. A tuberculous mother is the most dangerous member of the family, then in order is the father, then a sister to other sisters, and a brother to other brothers. A negative family history is of little significance, but if positive and shows intimate association it is evidence that must be given great weight in considering a given case.

Cough was present in 77%. This symptom is liable to be misleading, as it may be caused by so many other conditions besides tuberculosis. The more common are colds, bronchitis, influenza, enlarged or diseased tonsils or adenoid growth.

Weakness was noted in 54%. This, in our opinion, is the first and will be found the most frequent symptom of onset if children are carefully studied. It may be exhibited as undue fatigue, morning tire or nervous irritability.

Forty-six per cent. had poor appetites and digestive disturbances, and coincides with the same percentage reported as having lost weight. That this is due to toxemia is shown by the fact that these children, except when they have advanced disease, recover normal appetites and gain weight as soon as their play and exercise are restricted and suitable hours for rest and sleep are made a part of their daily routine.

Thirty-eight per cent. were reported to have had night sweats, but in our personal experience this is a rare condition except in advanced tuberculosis, and we do not attach much importance to the statement of the parents. Probably in most instances the sweating was caused by the use of too much bed clothing, or the child sleeping in a poorly ventilated room.

Fever was noted in 36% before admission. Careful observation, no doubt, would have found elevated temperatures at times in a much larger number. Nearly all of the sanatorium children have periods when the temperature ranges from 99 to 100. A temperature above 101 except in advanced disease is unusual, and when it occurs is nearly always due to some complications, such as tonsillitis, indigestion or other disease. Carious teeth and rickets will sometimes produce the same type of fever as does tuberculosis.

Pain was present in 35%. Our children often speak of having vague pains in the chest, but definite pleuritis is rarely found in early cases. Other observers have noted that tuberculous children often complain of pains in the legs. These pains are ill defined and are similar to the discomfort complained of by individuals who experience a sharp reaction from the tuberculin test.

Chills were reported in 29%. This would seem to us a too high figure. Except in cases that are far advanced we do not meet with this symptom in the sanatorium.

Hemoptysis. Blood was noted in the sputum in 10% of our cases. In nearly all this amounted to but little more than streaks. Occasionally a child would raise a little pure blood, but a frank hemoptysis has never occurred in our experience in a child under thirteen years of age. Bleeding from the posterior nares and from the hypertrophied adenoid tissue, which is so frequently found in a child's throat, may be a source of streaked sputum and should be excluded.

Sputum: This was positive in 19 out of 210 cases, or approximately 9%. It is interesting to note that of these 19 positive cases only 5 were discharged as apparently arrested and 2 as improved. This indicates that a child with open tuberculosis in its pulmonary form has a very bad prognosis.

Weight: About two-thirds of the children were below normal weight for their age. These averaged ten pounds under weight. A little less than one-third were normal in weight or above normal. This shows that the appearance of a child is not a safe criterion upon which to base an opinion as to the presence or absence of early tuberculosis.

Physical Findings. In 156 cases, 111 showed evidence of consolidation confined to one or both apices, and this usually extends downward into the interscapular space. This corroborates the x-ray evidence that the bronchial glands are first involved. In many of these cases no dullness can be made out anteriorly, even if it is pronounced in the back. There were but four cases in which the disease was confined to the bases.

Râles were found in 48, which was a little less than one-third of the cases. No râles, but other abnormal auscultatory signs, were present in 37%. In 69 others, no râles or other respiratory changes were found. Twenty-one of these showed a marked D'Espine.

It is difficult to formulate minimum standards for the diagnosis of tuberculosis in children. To do that we should have some definite landmarks to determine when infection in the child crosses the border line and becomes disease. As infection in city children is almost universal, we should be on the alert for the characteristic symptoms of tuberculin absorption and not wait for destructive changes in the lungs before instituting suitable treatment. We think the standard of diagnosis set down by the Committee of the National Association is inadequate, and that they have based their views not so much on diseased children as they have on the manifestations of tuberculosis in adults. They attach too much importance to the presence or absence of râles and to the results of tuberculin tests.

The presence of râles at the apices is usually due to tuberculosis, but they are not pathognomonic, as they may be present in influenza or other infection. Râles were present in only one-third of our cases. We should not wait for disease to advance until the pulmonary tissue is sufficiently infiltrated or congested to produce râles, if by a study of the child's constitutional symptoms we can determine with reasonable certainty that active disease is present in the thoracic glands. We must remember that the tuberculin test is positive in healed lesions as well as in active disease. The subcutaneous test should be used with caution. Nearly all children react to the von Pirquet test by the time they are fifteen years old, therefore, tuberculin tests are of but little value in a given case.

The following are two illustrative cases:

Two children of a man who recently died at the Westfield State Sanatorium, were brought to the institution for examination. Their father had died in the sanatorium a few months after he had been admitted as an advanced, progressive case. He raised a large amount of sputum in which the bacilli were numerous. For six months prior to his admission he had been confined to his home. Being very fond of his children he liked to have them near him and frequently fondled and kissed them. This was in the summer vacation so the children were subjected to prolonged and intimate exposure. The oldest girl, of nine years, gave the following history. She had had a severe cough with slight expectoration for a considerable time. Six weeks before her examination she had been operated on for enlarged tonsils and adenoids. This had no effect in relieving the cough. The child was nervous and irritable. She did not take her usual interest in play but preferred to lie about the house. Rarely she went out with other children, but would soon come back to lie down and rest. At frequent intervals she would have a fever ranging up to 100 for a few days at a time. She had raised a little blood two or three weeks before. Her appetite was poor. Physical examination showed nothing abnormal except a slight dullness at the left apex.

The other girl gave the same history except that she had raised no blood and had had no operation. Her tonsils were small and there was no indication of adenoids. Physical examination showed dullness and roughened breathing at both apices.

The mother was told to keep a temperature record and bring the children back three weeks later. The charts then showed frequent elevations of temperature to 99.4 and 99.6. The symptoms had not decreased in severity. The physical findings were more marked than before. We made a positive diagnosis of tuberculosis in each case and recommended the admission of both children to the sanatorium.

We cannot prove that these diagnoses were correct beyond the possibility of doubt, but we feel sure that they were justified by the history of exposure, constitutional symptoms and evidence of consolidation in the lungs. Why should we wait for râles to develop or for a tuberculin test in these cases before instituting treatment?

To summarize the essentials for a minimum standard necessary in the diagnosis of tuberculosis in children, we would emphasize the importance of symptoms indicating tuberculin absorption, namely: weakness, undue fatigue, fever, poor appetite, failure to gain, or loss of weight, and nervous irritability. The local symptoms are cough, hoarseness and occasionally streaked sputum. The usual physical signs are dullness in the interscapular region radiating into the apices at the back, frequently not elicited in front. There may or may not be changes in the respiratory sounds. Râles may or may not be present. Symptoms both constitutional and local, together with a history of exposure, are to be given greater weight in making a diagnosis of active tuberculosis than the presence or absence of physical signs. Percussion is more important than auscultation. We must, however, bear in mind that a thickened area in the lung or region of the bronchial glands does not in itself mean active tuberculosis. It may be a healed lesion that needs no treatment. Such thickening may also be caused by other diseases than tuberculosis.

The child showing constitutional symptoms, even without local signs of disease in the chest, should be considered suspicious, kept under careful observation and hygienic treatment instituted in the home. The case with signs in the chest, without constitutional symptoms, indicates an old inactive infection that needs no treatment. Individualization and common sense must be used to weigh all the factors in the case, and, with experience as a guide, few errors in diagnosis will be made.

What Should Constitute Reportable Tuberculosis.

By Francis George Curtis, M.D., Newton, Mass.,

Newton Board of Health.

I THINK that it is safe to say that, under present conditions, tuberculosis causes more trouble to local boards of health and is less capable of satisfactory handling by them, than any disease with which they are concerned.

The reasons for this are perfectly well known to men actively engaged in local public health work, although they may not be so evident to others and are as follows:

First, the lack of any definite agreement among local boards as to what does constitute reportable tuberculosis; second, the passage by the Legislature, for reasons undoubtedly known to itself, although they have not been made manifest to the ordinary observer, of certain statutes dealing with tuberculosis alone and the creation of a special state board in regard to it, and finally, as a result of these laws, the establishment of certain volunteer and amateur associations, ostensibly for the prevention of the spread of tuberculosis and the assistance of the local boards, but which, as at present managed, tend more to interfere with the local boards and lessen their authority than to do anything else.

Personally, I can see no more reason for the existence of a special state department for tuberculosis and of local antituberculosis associations, as they are at present managed, than I can for a special state department for typhoid fever or local anti-scarlet fever associations, and I believe that their existence has more to do with the present unsatisfactory situation in regard to caring for persons who are ill with tuberculosis than any other factors.

I believe that at the present time and under our present laws, it rests entirely within the power of local boards of health to declare what shall constitute tuberculosis within the meaning of the law and that their declaration will stand. I believe, further, that the declaration should be that, from the standpoint of the local boards of health, no person should be considered to have tuberculosis and be so recorded on the books of the department until he falls within the category of a person ill with a disease dangerous to the public health. He cannot fall within that category until his condition is such that he is capable, potentially at least, of transmitting the disease to others and, as our present knowledge teaches us that he can do this only by means of the bacilli, it follows that a person should not be considered to have tuberculosis until tubercle bacilli have been shown to be present in his sputum.

Having stated my proposition it is now up to me to show my reasons for making it, to defend it against possible attack and to show that it does not necessarily weaken any defense against tuberculosis which we may now possess.

Certain diseases are known to Massachusetts law by the term "diseases dangerous to the public health" and the supervision of practically everything in regard to these diseases is given by law to the local board of health of the community in which they may occur.

The law does not specify what diseases are dangerous to the public health but gives to the State Department of Health the power to declare from time to time what ones shall be so considered. After it has made this declaration, the direct power of the State Department of Health over these diseases apparently ceases, and from that time on the authority of the local boards of health over them becomes practically absolute. They can decide what to do with persons ill with such diseases, decide whether or not they shall be restrained, how long the restraint shall last, etc.

I cannot find any specific statement in the statutes as to the requirements for qualifying as a disease dangerous to the public health, but by common consent and usage there are certain characteristics which belong to practically all diseases included in the list, and chief of these is the liability of transmission from person to person, by direct contact or through an intermediate host.

The State Department of Health, acting under the authority of the statute, has published a list of diseases dangerous to the public health, and tuberculosis in all its forms is included in the list.

The duty of the local board of health, when a disease dangerous to the public health makes its appearance in the community under its jurisdiction, is defined by the statute, rather broadly, it is true, but it is, nevertheless, defined.

Sect. 36 of Chap. 75, R. L., as amended by St. 1906, Chap. 365, Sect. 1, and further amended by St. 1907, Chap. 445, provides that if a disease which is dangerous to the public health exists in a town, the selectmen and the board of health shall use all possible care to prevent the spread of infection. Other sections of the same law give the local boards of health the right to remove persons ill with such diseases to a hospital, to establish quarantine, to employ nurses, etc.

In order that the local board may have knowledge of the presence of such diseases so as to be able to take these measures, Sect. 50 of Chap. 75, R. L., as amended by St. 1905, Chap. 251, Sect. 2, and further amended by St. 1907, Chap. 480, requires every physician to report to the local board of health immediately, every case of such disease which he is called upon to treat. The report must be in writing, over his own signature, and give enough information to enable the board to locate the case easily. The local boards usually furnish post cards with spaces for the necessary information and have ruled that "immediately" means at least within 24 hours of making the diagnosis, and sooner, if possible.

I think it is not generally known that Sect. 49 of Chap. 75, R. L., amended as above and further by St. 1910, Chap. 269, and St. 1914, Chap. 177, requires the head of the household in which such disease occurs to make a similar report to the local board, the object being, of course, to make it as certain as possible that the local board receives notice of the existence of the case at the earliest possible moment.

As soon as a report of a case of a disease dangerous to the public health is received by the local board of health the machinery for protecting the public begins to move automatically.

It is not necessary to describe the working of this machinery, but it is worth while to point out the difference of view between the member of the local board of health and the practicing physician, when it comes to dealing with a case of such a disease as we are discussing.

The whole training of the man in public health work, or health offcer as he may be called, teaches him to look at such a disease from a diametrically different viewpoint from that of the ordinary physician; he is chiefly interested in the prevention of disease and in caring for the health of the public, while the practicing physician is chiefly interested in the cure of disease, and in caring for the health of the individual.

In other words, the health officer cares little for the individual and much for the public, and the physician is deeply interested in the individual, and, as a rule, cares little for the public.

This differing point of view has a very practical bearing upon the subject when it comes to dealing with a case, and often accounts for the seeming callousness of the health officer toward the individual, and explains why his position in regard to dealing with tuberculosis differs somewhat from that of others in the same work.

The majority of diseases with which the health officer deals have certain characteristics in common; thus, they are practically self-limited and tend to run a comparatively short course, the diagnosis is, as a rule, easy; they run fairly true to type; are known to be capable of transmission to others, *i.e.*, they are dangerous to the public health in the early stages and, as a rule, the liability of transmission is less in the later stages.

Tuberculosis, on the other hand, is not self-limited, is of comparatively long duration, difficult of diagnosis and protean in its manifestations; it is not capable of transmission in its early stages, and its liability of transmission increases in the late stages.

These facts make tuberculosis very difficult to handle, especially in its early stages, and furnish a strong argument in favor of making a positive sputum the criterion of tuberculosis from the point of view of the local board of health.

When a health officer has a person with a disease the physical signs of which are such that two supposedly competent men will give diametrically opposite opinions; when he himself feels sure that even if the patient has the disease for which he has been reported, he cannot transmit it to others at that stage; when he cannot truthfully tell the patient that he has the disease, because of which he is asked to take precautions, what on earth can the poor man do? His position is not a very strong one!

If, on the other hand, he can say to the patient that a laboratory examination has shown the presence of certain organisms in his sputum; that the presence of those organisms makes him a source of danger to his family and friends, just as he would be if he had diphtheria, and that the danger can be lessened by taking certain precautions, then the health officer's position is much stronger; he can speak much more convincingly and the patient is more apt to be amenable to suggestion. I say "suggestion" rather than "command," because the agitation which has more or less successfully attempted to place tuberculosis in a class by itself, has in a way defeated its own object and increased the difficulties of handling it. There is no question that the various special laws bearing upon the care of persons ill with tuberculosis have lessened the power of the local boards of health, and by giving a divided authority have made it hard to decide in certain cases just what body has control of the patient.

In addition, the establishment of a number of amateur associations for the care of persons ill with tuberculosis has undoubtedly increased the difficulties of the local boards. These associations are filled with a horde of well-meaning, but more or less hysterical persons, ignorant of the law and always ready to take a hand in the game the moment the word "tuberculosis" is mentioned, whose sole object in life seems to be to find fault with the local board of health, often for not doing that which it cannot do because of the very laws which they themselves have been instrumental in putting on the books.

These persons by their agitation have, I believe, accomplished one result, at any rate, although I have no hesitation in saying that they hadn't the slightest intention of doing it. They have created such a feeling of phthisiophobia among the general public that they have made many thoughtful men refuse to report their cases of tuberculosis in the early stages, because they do not wish to put a stigma on their patients and expose them to ostracism by the public and possible loss of their means of livelihood, by being compelled to give up work because their employers fear contagion.

These men have practically put into effect the very procedure here advocated, and show that they do not consider tuberculosis a disease dangerous to the public health, until it has been shown that it is so, potentially at least, by the demonstration of a positive sputum.

They take the risk of violating the law in order to do that which the law ought to require before branding a person as a danger to the public, and all because of the ill-advised agitation by persons who lack knowledge and are frightened at a word!

I think I can show that the law of Massachusetts, as it exists today upon the statute books, has practically declared that the demonstration of the presence of tubercle bacilli in the sputum is a prerequisite to declaring that a person has tuberculosis. In other words, it has given a definition of tuberculosis, although perhaps such definition was not intended.

There is a statute, which is commonly known as the subsidy law, which provides for the payment by the state of a subsidy of five dollars per week for every case of tuberculosis which a city or town cares for in a private hospital.

Officially, this statute is known as Chapter 579 of the Acts of 1911 as amended by Chapter 637 of the Acts of 1912, and further amended by Chapter 57 of the General Acts of 1916, and reads as follows:

> Every city or town which places *its patients suffering from tuberculosis* in a municipal or incorporated tuberculosis hospital in this commonwealth, or in a building or ward set apart by a municipal or incorporated hospital in this commonwealth, for patients suffering from tuberculosis, shall be entitled to receive from the commonwealth a subsidy of five dollars a week for each patient who is unable to pay for his support, or whose kindred, bound by law to maintain him, are unable to pay for the same; *but a city or town shall not become entitled to this subsidy unless,* upon an examination authorized or approved by the trustees of hospitals for consumptives, the sputum of such patients is found *to contain bacilli of tuberculosis*, nor unless the hospital building or ward is approved by said trustees, who shall not give such approval unless they have by authority of law, or by permission of the hospital, full authority to inspect the same at all times. Said trustees may at any time withdraw their approval. They shall not approve claims for subsidy hereunder for more than thirty days prior to the date when notice is mailed to them that a subsidy in any given case is claimed.

The conclusion is perfectly obvious that, in order to obtain the subsidy for a case of tuberculosis, the local board must show that the patient is actually ill with tuberculosis and under the law, the only evidence of this which the state will accept is the presence of tubercle bacilli in the sputum.

The trustees of hospitals for consumptives admit that the reason for putting that proviso in the law was to save the state from paying the subsidy on a lot of non-tubercular cases. I am not quite sure whether that is an admission on their part of the fallibility of the physical signs or a reflection upon the integrity of local boards of health in general, and care very little which it may be; the main point is that they have, though probably without intending it, put a definition of tuberculosis upon the statute books of the state, and have made the demonstration of the presence of tubercle bacilli in the sputum, *i.e.*, a positive sputum, a necessary prerequisite of calling a case tubercular when the subsidy is claimed.

I believe that I have shown sufficient reasons to justify my contention that from the point of view of the local board of health, no one should be recorded as having tuberculosis, a disease dangerous to the public health, until it has been shown that such person is a potential source of danger to the public.

The same reasons also answer many of the objections which may be urged against such a declaration, and such a declaration would be of distinct advantage to the health officer because it would give him something definite upon which to base any action he might take.

It would also lighten his burdens very materially when it comes to dealing with the amateur societies and volunteer workers already referred to, who give him no peace whenever they hear of a person who is even remotely suspected of having tuberculosis. He could simply point out that a number of careful examinations have failed to demonstrate the presence of bacilli and that, as a consequence, the patient, even though he may be thin and pale, does not come within the law.

It may be pointed out that it is difficult to demonstrate the presence of bacilli in the sputum when they are present in small numbers, and that in this way persons who have bacilli and are, therefore, dangerous to the public health, would be undetected and liable to spread the disease.

My reply to that is that under present conditions many persons whose sputum is known to be loaded with bacilli are going about freely, spreading their bacilli broadcast, and a few undetected cases would make no difference.

If the local boards had the power, or rather were allowed by the courts to exercise the power which I believe they have, to restrain these persons, the objection referred to might carry some weight, but as they have practically no control over so-called incorrigibles, the objection falls to the ground.

There is no reason why either the physician, the patient, or the local board should be satisfied with a single sputum examination, if it is negative. It is fair to suppose that the physician had some reason for asking for an examination, and if the result is negative he should ask for a second, or even a third, exactly as he would in a case where the clinical symptoms led him to suspect diphtheria or typhoid fever, but the laboratory report was negative.

Of course if the examinations continued to be negative for a period of several years, the fair deduction would be that the patient has not tuberculosis.

Another objection which will surely be raised is that by waiting until the presence of bacilli can be demonstrated, much time may be lost, and many so-called incipient cases, which might be arrested if sent to a sanatorium, will not come under treatment until too late to accomplish anything. I believe that this is more imaginary than real, because at present a patient, even if he has tuberculosis, cannot be sent to a sanatorium unless he is willing to go and, under a recent ruling of the Superior Court, since upheld by the Supreme Court, it isn't necessary for a patient to have tuberculosis at all in order to go to a sanatorium, if he wants to go.

Furthermore, under another ruling, any physician may send a patient to a sanatorium on a most casual physical examination, provided the patient is willing to go.

It appears that there is at present very little difficulty in sending anyone to a sanatorium who wants to go.

Massachusetts has—on paper—one of the best systems for caring for persons ill with tuberculosis that exists today,—but in actual practice it breaks down because it rests entirely upon the consent of the patient to be taken care of. If he is willing to go to a sanatorium, and stay there after he goes, he has the advantage of skilled treatment while he is there, and of supervision and assistance from both the state and the municipality after he is discharged, but if he doesn't want to go or will not stay after he gets there, I know of no power that can make him do either.

It is evident that the proposal to confine the legal definition of tuberculosis to those cases in which a positive sputum has been demonstrated would have little bearing upon the admission to sanatoria of persons whose physical signs are such as to lead to the belief that they are possibly in the incipient stages of the disease, provided such persons are willing to go. If they are not willing to go they wouldn't go, just as they will not now, so it would make no practical difference either way.

It might have a marked effect upon vital statistics by increasing the deaths from tuberculosis and bringing it nearer the truth. Anyone at all familiar with death records knows that while many are filed giving the cause of death as tuberculosis upon very slight evidence, on the other hand, the deaths of many persons known to be tubercular are recorded as being due to "bronchitis," "heart disease," "anemia," and similar diseases; the reason for this being that many insurance companies refuse to pay on persons dying of "tuberculosis," if the death occurs within a certain period of the writing of the policy. If there was a settled test of what should constitute tuberculosis, all this juggling with death returns would cease and the statistics come nearer the fact.

It would, however, change the responsibility for their care if they did go, because not being persons ill with a disease dangerous to the public health, the overseers of the poor, and not the local board of health, would have to care for them. This is a minor matter, and is merely a return to the method in vogue previous to 1909, when the overseers paid the bills for such persons.

On the whole, I believe that the change might bring about a much-desired reform in procedure and tend to restore power to local boards in caring for persons who have tuberculosis; for if it were once understood that no one should be officially recorded as ill with tuberculosis unless it had been demonstrated that he was potentially capable of transmitting the disease to others, and so a source of danger to the public, the courts and the public generally would be more prone to acquiesce in such measures of restraint as might be imposed upon the patients.

Under present conditions it must be admitted that it is a lamentable fact that there is no real control over persons who have tuberculosis, unless they choose to submit to the requests of the local authorities. This being true, it is equally evident that any change in the methods in vogue must be for the better, and that the criterion of tuberculosis which I have proposed cannot in any way diminish the actual power which boards of health have over tubercular patients, and consequently it will not be a backward step.

For that reason I have no hesitation in saying that if the presence of tubercle bacilli were generally adopted as a necessary prerequisite to recording a person as having tuberculosis, it would not in any way decrease the efficiency of the present working methods of control of the disease and, as I have tried to point out, it might even strengthen them.

The crying need at the present time, in my opinion, is some method of procedure which will put tuberculosis back where it belongs, on a plane with other diseases dangerous to the public health, and permit the health authorities to take such measures as they feel sure are necessary. In addition, unauthorized interference by outsiders should cease. The responsibility for the care of persons ill with tuberculosis and for the protection of the public from possible infection by such persons, has been given by law to the local boards of health, but their efforts are handicapped and often neutralized by the interference of irresponsible outsiders, who move them from place to place at their own sweet wills and fill them up with misinformation.

If an unauthorized person moves a patient who is ill with diphtheria or scarlet fever from one town to another, or if such a person absconds, he is hunted down and put under restraint, and the person responsible for the act may be punished. Why? Simply because the patient has a disease dangerous to the public health, and may give it to others.

If, however, the patient has tuberculosis, a disease dangerous to the public health, he may go about freely, and the most that happens is that the local board of health of the town from which he went may notify the other board, if it happens to know about it and isn't too busy!

Every one of us in public health work knows that this is true and knows that our methods for the control of tuberculosis are farcical, but we are inclined to shut our eyes and talk of what a splendid system we have—on paper.

What we should do is to face the facts and do our best to limit the use of the term "tuberculosis" to those cases which really are dangerous to the public health. Our position would then be much stronger, and we could probably get some control over persons whom we all know are dangerous.

Definitions and Diagnostic Standards in the Diagnosis of Pulmonary Tuberculosis in Adults.

By John B. Hawes, 2d, M.D., Boston.

One of the problems that confronted Dr. Armstrong and the committee interested in the experiment now being carried on in Framingham, was to decide upon some definite set of standards on which the diagnosis of tuberculosis should be based. The need of standardizing this subject is, of course, evident. There is a tremendous difference of opinion among physicians and those possessing special knowledge upon the subject, as to what constitutes clinical tuberculous disease. Patients are constantly going from the Massachusetts General Hospital Out-Patient Department, for instance, to the Out-Patient Department of the Boston Consumptives' Hospital, and from there to the Boston Dispensary, and are getting radically different diagnoses and different advice. If this holds true at large clinics in Boston, where men who are to a certain extent specializing in this work are in charge, it will hold true to a far greater extent among general practitioners, whether in Framingham or throughout the country.

I was asked to submit to a committee in charge of this matter a set of diagnostic standards for this purpose. I found this a most difficult task. For instance, among the symptoms which I considered of importance, I immediately put down "loss of weight"—but then I at once asked myself what constitutes loss of weight. How much weight, for instance, must I myself lose and over how long a period of time before I should consider it an important symptom? The same thing applies to the term, "rapid pulse." We are far too apt to say glibly that loss of weight, loss of strength, rapid pulse and fever are important symptoms in the diagnosis of tuberculosis. When one comes to analyze these terms, however, it is evident that unless they are clearly defined they mean little or nothing. This applies particularly to the word "hemorrhage." There is probably no symptom more alarming to patients and yet so hard to define accurately as hemorrhage. Therefore, in conjunction with these diagnostic standards, I prepared certain definitions as suggested above. The committee made various minor changes in the draft which I submitted, which in its final form is nearly as follows:

DEFINITIONS.

1. *Loss of Weight.*—By "loss of weight" should be understood an unexplained loss of at least 5% below normal limits for that particular individual within four months time.

2. *Loss of Strength.*—By "loss of strength" in its pathological sense is meant undue fatigue and lack of staying power which are unusual for that individual patient and which cannot be satisfactorily explained.

3. *Fever.*—An occasional temperature of 99° should not be considered "fever." A temperature which persistently runs over 99° when taken at least four times a day over a period of one week (by mouth five minutes) should be considered of significance and constitutes fever.

4. *Elevation of Pulse.*—Where the average normal pulse of the patient is already known, an elevation of 15 beats per minute, when the pulse is taken quietly at home during various periods of the day, should be considered abnormal. In cases where the average pulse is not known,—and of course this constitutes the majority of cases,—one should consider an average pulse of 85 or over in men, and 90 or over in women, to be abnormal. The combination of a subnormal temperature and an elevated pulse as defined here should be considered of great importance.

5. *Hemorrhage.*- Any amount of blood, with or without sputum, requires medical investigation as to its source. Blood streaks, blood spots, etc., may or may not mean tuberculosis. On the other hand, a hemorrhage amounting to one or two teaspoons is presumptive evidence of the disease.

6. *Family History.*—An occasional case of tuberculosis in the patient's uncles, aunts, cousins, etc., should not be considered of importance. It is an important fact when the patient's immediate relatives, such as father, mother or grandparents have been tuberculous.

7. *Exposure.*—Childhood exposure, no matter how slight, is of the greatest importance. Moderate exposure among normal, healthy adults of cleanly habits is of less importance. Of course, prolonged contact, with unhygienic habits or surroundings, may be a dangerous factor at any age.

8. *Cough.*—No cough is characteristic of tuberculosis. A persistent cough for six weeks requires investigation. Tuberculosis can exist without any cough whatsoever.

9. *Sputum.*—The presence of sputum is not necessary for a positive diagnosis. Constant sputum, with or without cough, requires investigation. Absence of bacilli in the sputum after one or several laboratory examinations is not necessarily proof against the presence of tuberculosis.

10. *Hoarseness.*—Any hoarseness or persistent "huskiness" requires investigation.

DIAGNOSTIC STANDARDS.

On a basis of these definitions, the following minimum standards in the diagnosis of pulmonary tuberculosis have been formulated:

11. When constitutional signs and symptoms and definite past history are absent or nearly so, there should be demanded definite signs in the lungs, including persistent râles at one or both apices. By "persistent" it is meant that the râles must be present after cough at two or more examinations, the patient having been under observation at least one month.

12. In the presence of constitutional signs and symptoms, such as loss of weight and strength, etc., as defined above, there should be demanded some abnormality in the lungs, but not necessarily râles.

13. Usually a process at the apices should be considered tuberculous, and a process at the base to be non-tuberculous until the contrary is proved.

14. A hemorrhage as defined above is evidence of active pulmonary tuberculosis until the contrary is proved, except when a clear history of pleurisy is present.

15. One should consider a typical pleurisy with effusion as presumptive evidence of tuberculosis. One should also consider a dry pleurisy as evidence of slight tuberculosis.

16. Pain in chest and shoulders, night sweats, digestive disorders, etc., may be present and should be investigated.

17. In every doubtful case one should demand that the patient be kept under observation for at least one month, with repeated sputum examinations, before making a definite diagnosis.

It will be interesting to see whether or not these definitions and diagnostic standards prove satisfactory for the general practitioner to use. It is perfectly clear that there will be many cases which must be looked upon as exceptions to the rule, and which will not fit into these standards. I do believe, however, that the great majority of diagnoses should be, in a general way, based upon these standards as here given.

DISCUSSION.

Dr. Arthur N. Broughton, Jamaica Plain: Dr. Lyman has covered very thoroughly the methods to be employed in making a diagnosis of tuberculosis. It seems to me that this method rests upon exactly the same principle as that of making any other diagnosis in those cases which come to the general practitioner. To get a correct diagnosis, whether in a surgical case, as in an appendix, duodenal ulcer, or in any other such problem, the whole picture is essential, rather than any one particular finding.

There is no one symptom that is exclusive evidence of appendicitis or any of the above-mentioned conditions. In the same way, except for the presence of tubercle bacilli in the sputum, there is no conclusive evidence of tuberculosis. To wait until bacilli are found in the sputum is to wait altogether too long to do the patient much good. It is perfectly obvious that one examination of the sputum which is negative, is of no more value than one examination of urine which does not have albumen, or of the blood which does not show a leucocytosis or Widal, or any other single examination. It is the composite picture as a whole that aids us in establishing the diagnosis of tuberculosis.

In approaching a case where tuberculosis is established, I have tried to differentiate in my mind between the needs of the patient and my duty toward reporting the disease to the Board of Health. For the purposes of the Board of Health, it is fair, I think, as Dr. Curtis has pointed out, that only those cases be reported which have tubercle bacilli in the sputum, thereby becoming a direct menace to the community. If repeated examination of the sputum shows no bacilli, even though in my own mind I strongly suspect the existence of tuberculosis, I think it is fair to give the patient the benefit of the doubt. As one of the speakers has pointed out, an extraordinarily large proportion of all children, and we may also include a large proportion of all adults, have had at some time or other a tubercular infection. Change of conditions has helped to arrest the process. I cannot believe that we should be expected to report every case falling under this head.

On the other hand, whether or not there are bacilli in the sputum, if there is reason to expect that the case will get away from careful observation,—as in the case of particularly ignorant or remotely situated families,—then it is the duty of the physician to report the case.

Practically, in those cases coming with a progressive loss of strength, occasional afternoon temperature over a period of a week, with moderate loss of weight, increased pulse, pallor, and the other symptoms to which Dr. Hawes has referred, I assume that the patient has a tuberculous process somewhere. I inquire with the utmost care into the family and previous history.

I cannot believe, as one of the speakers has stated, that there is any large proportion of men doing general work, who would not take the trouble to strip a patient and make a careful examination of the chest. On the contrary, I believe there is a very large proportion of men doing general work who would do just that,—quite as large as the proportion of internists who would make a careful, comprehensive consideration of the whole picture in making a diagnosis. When, in addition to a careful examination and frequent examinations of the sputum, we have an x-ray of the chest, it is usually not very difficult to make an early diagnosis,—long before there are actual physical signs in the chest. In this connection, I may say that I have had no difficulty in getting whatever x-rays were necessary for the patient, regardless of his ability to pay the expense.

Dr. Lyman has pointed out that many cases which were unquestionably tubercular had no persistent symptoms in the chest. Particularly is that true of children having mesentery glands or generalized tuberculosis, or tubercular adenitis.

A word of caution may be spoken in regard to placing too great reliance upon x-ray findings. The existence of calcified areas, increased density of the bronchial tree, and even fairly extensive shadow needs much more to go with it to make up a picture of tuberculosis.

One disease, not uncommonly confounded with tuberculosis, which should always be kept in mind in adults or children, is latent hereditary syphilis. It is extraordinary in how many instances cases of unexplained temperature, lowered resistance to infection, long-continued history of illnesses, will be cleared up by a careful family history taken with an x-ray of the long bones. The Wassermann is very rarely present, as one would expect in these cases, which may be really an end-result of a chronic disease.

Dr. W. Irving Clark, Worcester: After such a very thorough consideration of all sides of tuberculosis in the incipient stage, it seems almost impossible to find anything which has not been touched upon. One thing slurred over is the question of the importance to the patient of the early, correct diagnosis. It is tremendously important to the patient to get this definite diagnosis as early as possible. A patient who is held hanging on a string more or less is in a very awkward and unpleasant position. He does not know whether he has to close up his affairs; whether he is possibly exposing his family to the disease; the sooner he can be put out of misery the better.

That brings us down to the question of how we are going to make our diagnosis in the quickest possible way. I think one of the great dangers in this is one which has been pointed out by Dr. Lyman: the fact that so few patients have had a physical examination at an early period. The general practitioner does not like to have the patient strip and make a careful examination of his chest. I do not know why, but my experience has been that that is the case. If we could only get it before the practitioner at large that when a patient comes into his office with a history of cough, even of short duration, he should make an examination of that patient's chest, we should get hold of many cases of tuberculosis much earlier than we do at the present time.

In the second place, I feel that in every community there should be some central station where the diagnosis of possible tuberculosis can be checked up. This is particularly applicable to the smaller country communities where it is very difficult to send a patient into Boston or into the nearest city. I think it would be a step in the right direction if there should be possibly a travelling tuberculosis expert,—a man who would be able to confirm to a degree the diagnosis of a local physician,—to travel as a circuit judge travels and be prepared to make a positive diagnosis and to help the general practitioner in that district.

In regard to symptoms of early diagnosis I have found that listlessness in the afternoon is one of the most valuable symptoms. I do not think this is brought out sufficiently. It is very difficult to be sure about an afternoon temperature in a patient who comes into your office. You are not quite sure that the patient has had that afternoon temperature for a period of a week before. If that patient tells you that he has not been feeling like doing anything much in the afternoon for some time; that he feels tired at four or five o'clock in the afternoon; that he would like to stay at home and lie down—then you should begin to get suspicious, regardless of the other history he gives you.

Physical signs—I think that sub-crepitant râles at one of the apices, persistent, is a pretty definite sign whether your percussion shows any change there or not. Sub-crepitant râles which persist over three examinations to me are a very suspicious sign and I am almost willing to make a definite diagnosis on them.

Extra-pulmonary râles I think are very difficult to diagnose,—making a patient go through the motions which will produce an extra pulmonary râle; taking hold of the nose and making the motions of an inspiration very often will bring them out. Some patients find this experiment difficult. Those cases I find are more troublesome than any others.

Dr. Charles H. Cook, Natick: I do not speak as an expert in tuberculosis, but I know, as a matter of memory, most of you as a matter of history, what was taught on this subject more than forty years ago. At a clinic in Bellevue Hospital, I heard Alonzo Clark, then professor of medicine in the College of Physicians and Surgeons, New York City, make this statement: "While I am not prepared to say that the spitting of blood lengthens one's life I am prepared to say that it does not shorten it." (Of course he was not speaking of profuse hemorrhages.) Do you of today endorse that statement? This calls to mind two experiences of my own: In the late 70's a well-nourished lady was brought to my office who had raised blood several times that morning. Physical examination revealed nothing abnormal. I did not have the suptum examined, for the tubercule bacillus had not been born. Nothing further developed in the more than thirty years following, during which I continued as her physician. Within the last five years she died with cancer of the bladder, verified by an autopsy. In March, 1884, a patient had so free bleeding from the lungs that I was obliged to keep her in bed, with positive orders not to speak, even in a whisper, for more than a week before the bleeding ceased. That patient is still living and is at present under my care with arteriosclerosis and high blood pressure.

As regards negative reports in sputum examination, the good Lord has been very kind to me, for I have as yet had no cases develop tuberculosis following such a report.

I want to express my obligation to Dr. Hawes for his sentence in his book, "Early Pulmonary Tuberculosis": "Were the stethoscope used less and the thermometer and common sense used more, there would be fewer mistakes."

Dr. Francis P. Denny, Brookline: I would just like to say a word about Dr. Curtis' proposition to consider only as tuberculosis from a board-of-health point of view, cases with tubercle bacilli. I sympathize in a great many ways with that position. I think it would simplify board-of-health work very much and put it on a rational basis. On the other hand, we are building up a machinery now for fighting tuberculosis, with our dispensaries and tuberculosis nurses, for which we need information of the cases that do not have tubercle bacilli. We should feel that any one with active tuberculosis, without bacilli, is likely to become a source of danger, and for that reason should be under the supervision of the board of health, just as we supervise individuals who have been exposed to a contagious disease and who are likely to become a danger as a result of it. I think we should lose a great opportunity to do preventive work in tuberculosis if we did not have knowledge of those individuals who have an active tuberculosis without bacilli.

Dr. Ralph W. Jackson, Fall River: A few years since one of the best-known internists in Boston remarked to me that, in any case of doubtful pulmonary trouble, he considered that the discovery of the existence of any peri-anal suppurative process is proof sufficient of the existence of tuberculosis in the lungs. Dr. Lyman is the only man, who has spoken today, who has hinted even at the use of these septic processes as a possible aid in diagnosis.

Two incidents come to my mind which make me question whether our state sanitaria are making sufficient diagnostic use of them or paying sufficient therapeutic attention to them.

Probably four or five years ago, while visiting Lakeville in company with a number of other physicians, who had been invited there as guests to inspect the institution, I asked the superintendent how many of the patients had fistula or other rectal trouble—I was seeking material for a paper which I was preparing on fistula; but he frankly told me that he had no definite knowledge or data and could not help me.

More recently a patient has been under my observation who was in Rutland six or seven months in 1916. His was a perfectly plain case of pulmonary tuberculosis, and he was discharged as an arrested case and greatly improved in general health. But during the last three months of his stay there he had developed a fistula which was making him very uncomfortable, yet its existence was not known to the institutional authorities, either during his stay, or at the time of his leaving. He shortly appeared at my rectal clinic at the Carney Hospital Out-Patient Department with a fistula which had all the earmarks of being tubercular. There was a sinus of some extent around one side of the anus and upward for two or three inches under the anal and ampullar mucosa. After considerable care, surgical and otherwise, we now have him about straightened out and, I think, at work.

In view of the frank statement from Lakeville and this case from Rutland, I asked the question whether enough attention is paid to such conditions at the Massachusetts sanitaria. I think the query is justified.

Dr. John F. O'Brien, Boston: The law makes it mandatory that we report cases of tuberculosis. If I interpret rightly the meaning of the paper we have just heard, it is a protest against such a law, and in favor of one which would exact notice from the physician only in the event of a positive sputum. We are concerned with this question not only by reason of its bearing on the lives and fortunes of our patients, but because of our vital interest in the results to the community at large of any modification of already existing law.

I submit that there is no antagonism between the public health officer and the physician in private practice, save in very isolated instances. The physician is, as a rule, responsive to the suggestion of the health official, and anxious to do his bit in promoting the general well being of the public. Is this done by lending enthusiastic support to the law which comprehends all cases of tuberculosis? Or should we ask that it be modified, fearful that injustice or hardship will come to the unfortunate sufferer who is to be free from the inspection of the public health official, until such time as it becomes evident that he is a veritable menace to the community? Are we to subscribe to the proposition that arrested bone and glandular affections, tuberculosis of the skin, peritoneum and meninges, and all incipient cases, are to have only an academic interest for our public health officials—that their attention is not to be called to them until infection has so far progressed as to permit the classification "a moderately advanced case"?

I fear that much good work would be undone should we allow ourselves to take this view. On the other hand, no man of experience will deny that injustice has been done by reporting tuberculosis where the diagnosis has been based on very slender physical signs. There has arisen a wholly unwarranted fear of the individual who is in the beginning of his tubercular days. His home comforts, employment, and, as a natural sequence, sustenance for his family are frequently jeopardized by hasty judgments, or by ill-advised follow-up methods on the part of the authorities.

It is difficult to say, of course, just where the line is to be drawn. The financial resources of many of these people are so slender as absolutely to forbid supervision excepting by public health officers. I see no way in which this is to be remedied. I trust I shall not be misunderstood when I say that the physician who can keep watch over his incipient or arrested cases ought to be allowed some latitude. I believe it to be extremely hazardous, however, to advocate anything which would eliminate from occasional supervision the man with fairly definite signs of tuberculosis, and lacking only positive sputum.

The conscience of the physician should decide whether or not his patient will fall into the class of those whom he is sure to see at regularly stated intervals. Common sense ought then to govern his action as it does, or should do, in the enforcement of *all* laws. With this exception I would stand for the law as it is written today.

I can sympathize with the public health official who finds at times that his arduous and most intelligent efforts are nullified by the well-meant but misdirected zeal of those who have but recently begun to manifest any interest whatsoever in public health questions. My opinion is that in all probability such will always be with us, and we must consider them as part of the day's work. Their occasional mistakes should not, however, blind us to the immense amount of good work performed by them. A calm and dispassionate judgment must result in our admitting that much of the progress made in matters of personal hygiene and cleanliness, and a lower death rate, has been coincidental with the formation of volunteer organizations and special commissions.

DR. EDWARD O. OTIS, Boston: The papers presented this afternoon upon this old, but ever new, subject of the early diagnosis of tuberculosis, with their discussion, have been of much interest, and we are greatly indebted to those who have so clearly and fully presented the subject.

Strictly speaking, we cannot make a truly early diagnosis of pulmonary tuberculosis. As the farmer remarked after seeing the hippopotamus at the circus: "There ain't no such animal." The diagnosis of active or clinical tuberculosis can only be made when we have definite *symptoms* of the specific toxic infection, whether or not there are co-existing physical signs, and when such symptoms have developed, the disease has progressed beyond a theoretical early stage, only it is as early as we can make the diagnosis.

As Dr. Lyman has said, one must bear clearly in mind the distinction between pathological or anatomical tuberculosis and clinical tuberculosis. The former has no symptoms, interferes in no way with one's general health and requires no treatment.

In a recent examination of third-year students I asked the question: "What cases of tuberculosis require no treatment?" referring to this pathological tuberculosis which Dr. Lyman mentioned, and I was somewhat surprised to receive several answers to the effect that far-advanced cases required no treatment because they were hopeless anyway.

I have not infrequently seen cases which have been diagnosed as clinical or active tuberculosis, from doubtful or indefinite physical signs, in which there were none of the characteristic symptoms of active disease. When symptoms are lacking, even if certain physical signs are present, such as slight apparent dulness and modified respiration, only "watchful waiting" is necessary. The moment, however, definite active symptoms appear then active treatment should be instituted. And yet, how great the temptation to temporize and defer active treatment until we satisfy ourselves that unmistakable physical signs are present, thus, perhaps, losing the golden opportunity for the most successful treatment.

As to the most important and characteristic symptoms, each one of us may differ somewhat according to our experience. I suppose that all would agree that a rapid pulse, constant afternoon temperature, a continuing cough, and loss of strength and weight are cardinal ones, of the first magnitude. The weight placed upon the many other symptoms will depend, as I have said, upon one's personal experience.

As to physical signs, I have only to say that doubtful deviation from normal resonance and indefinite modification of the respiratory murmur are not sufficient evidence, in my opinion, for making a diagnosis of early pulmonary tuberculosis. Râles, however, are a different proposition. They are wholly adventitious sounds, not modifications of normal ones, and when persistent and localized at one or the other apex, this sign alone goes far towards making a definite diagnosis.

As to hemoptysis, this striking symptom, as has been said, is almost pathognomonic, still occasionally spitting of blood may come from another source than that of a tuberculous lung, and one should be careful to exclude all other possible causes of the hemorrhage, in the upper respiratory tract, from a cardiac lesion or elsewhere. I recall a case that I was called to see as one of hemorrhage of the lungs, but which apparently was consequent upon a cirrhosis of the liver in an alcoholic person.

With regard to the reporting of tuberculosis: shall we report only such cases as have tubercle bacilli or all cases which, in our opinion, are actively tuberculous whether there is a positive sputum or not?

I remember that some years ago I asked the opinion of the chairman of the Boston Board of Health upon this point, and his answer was that whenever I was convinced that I had a case of tuberculosis I should report it. If one reports only cases that have a positive sputum, then it is obviously not enough to obtain a single negative by the ordinary method of examination. Either such examination should be repeated several times or some of the more delicate tests should be employed, such as the antiformin, the Ellerman and Erlander, and the complement fixation tests. I should like to call the attention of the section to the recently published results obtained by the latter test by two of the members, Dr. Slack, recently bacteriologist of the Boston Board of Health, and Dr. Burns of the Reading sanatorium.

Dr. Charles E. Prior, Malden: When Dr. Hawes asked me to participate in the discussion, my first thought was to get a glimpse of Dr. Curtis' paper. I am glad I did not as I should have missed the tonic effect that paper had on me. There is a good deal to be said on that subject. It seems to me it is more or less a local problem. We do not have any such trouble in Malden as Dr. Curtis speaks of. I wonder if it is not something in the way we have approached the problem. We do not feel that cases of tuberculosis should be reported, however, as scarlet fever and diphtheria are reported, so as to quarantine them, but because the legislature has included tuberculosis among the other diseases dangerous to public health, and in order that we may find these people, and do something for them. It seems to me there are very few cases where tuberculosis will escape the supervision of careful observers if that supervision is properly carried out. I can mention to you quite a number of cases of tuberculosis ill in their homes. I know that they are no menace to the people in their households and there are several small children in the families.

I wish we had some test like what we have for diphtheria by which we could put our finger on the disease and say right off, it is tuberculosis, but, as physicians have shown today, there are a good many cases of tuberculosis we cannot make out that way. Those cases require a good deal of supervision,—require a good many observations. That is where our tuberculosis dispensary comes in. If we approach these people, not with the feeling that they are a menace to the public health, but that they are unfortunate individuals, and our duty is not to isolate them but to help them, we have the best reason for requiring a report of all cases, whether with or without positive sputum.

I can say for the city of Malden that the doctors are helping me in every way. I am finding very little opposition on the part of the physicians to carrying out our tuberculosis program. There is no society in our city which professes to help out the board of health except the Malden Anti-Tuberculosis Society. They made me president of that and chairman of the board of health, so everything works quite peacefully.

I must say once more I am strongly in favor of reporting all cases of tuberculosis. On the other hand, I am not in favor of putting the screws on people, making those people feel as though they are isolated cases and people to be shunned. I think that with this attitude we can carry out the present provisions of the law although I think some time the statutes may be so modified as to make a distinction between tuberculosis, which, under careful management, can be shorn of its danger to the public health, and scarlet fever, for instance, which, with our present knowledge of its means of transmission, cannot be so easily handled.

Dr. Ralph E. Stone, Beverly: Dr. Chadwick has presented the subject of "What Justifies a Diagnosis of Tuberculosis in Children" so clearly and interestingly I think there is little left to say upon the subject. I heartily agree with him in laying stress on the matter of contact, especially if intimate or prolonged.

The symptom which has been of utmost importance to me has been the question of being easily fatigued. The child who complains of being tired first thing in the morning, or who has no inclination to play, or becomes tired very easily, makes me suspicious of trouble. While we are on the subject of "Suspects," it seems to me that the tendency is too often to slur over the suspicious cases and not give them due investigation. These cases must be diagnosed by the process of elimination. If we are unable to account for their fatigue, their elevation of temperature, etc., in any other way, after going over them with a fine-tooth comb, as it were, we must finally come to the conclusions of tuberculosis.

I believe that the fact that it is impossible to investigate in general hospitals the many difficult cases of diagnosis is a great detriment to the doctors and to the patients. The recommendation of the National Association a year ago, that wards be established in general hospitals for the study of these difficult border-line cases, ought to be carried out. It is a great pity that a diagnosis so important to everybody concerned as tuberculosis should not have the full benefit of all the aids which a general hospital can give in the way of diagnosis.

In conclusion I would say that with a history of contact and with constitutional symptoms, even in the absence of physical signs, the diagnosis of tuberculosis in children is not only justified but incumbent upon us.

Dr. J. Herbert Young, Newton: You gentlemen will agree with me, I think, that the time has already passed when it is necessary to find dulness, bronchial breathing, râles, and tubercle bacilli in the sputum before it is possible to make a diagnosis of pulmonary tuberculosis in an adult. I hope that the time is now passing when it is necessary to have definite, well-marked physical signs in the lungs before making a diagnosis in a child. If we wait until a child has a tuberculous pneumonia, or a tuberculous meningitis, before we make a diagnosis of tuberculosis, the disease has already progressed beyond our control. If the theory is sound, that a majority of the cases of tuberculosis in adults is a lighting up of an old process acquired in childhood, then it is especially important that we should make the diagnosis in children and make that diagnosis early.

The question of the family history, it seems to me, cannot be over-emphasized. An infant that is exposed to tuberculosis almost always contracts the disease. By family history we mean more than relatives. Family history should include everybody that comes in intimate contact with the child. It is to my mind relatively unimportant if a child has an aunt whom he has never seen, who has tuberculosis or has died of tuberculosis. It is very important to know, for example, if a child has recently had a nurse who has been obliged to give up work because she had "some trouble with her lungs."

In children the von Pirquet reaction is of great diagnostic value, although its limitations should be appreciated. A single negative reaction does not exclude tuberculosis. Several negative reactions give valuable evidence that the child is free from the disease. A positive reaction shows that the child has somewhere in his body a focus of tuberculosis. This focus may be either active or latent. The younger the child the greater the chances that the focus is active. A positive reaction in a case where there are suspicious signs in the chest does not necessarily mean that the signs in the chest are tuberculous; the signs in the chest may be due to influenza—the positive von Pirquet reaction due to a latent glandular tuberculosis.

I have nothing more to add except that I think this is a very important subject, and I am very glad indeed that Dr. Chadwick has brought this to your attention.

Original Articles

CLINICAL DATA OF GALL-BLADDER DISEASE.*

By Ralph W. French, M.D., Fall River, Mass.

From November, 1905, to August, 1916, there were 300 operations for gall-bladder disease at the Truesdale Hospital. In this number are included 10 that were operated on twice and 3 that required a third operation. A review of the clinical records gives data of considerable interest.

Predisposing Causes. It is impossible to determine at what age biliary calculi are usually formed, because no one knows how long they may remain quiescent. It seems reasonable to suppose, however, that most gallstones are formed between the ages of 20 and 40, when the system is most liable to the other infectious diseases. In this series the average age at the time of operation was 47, the youngest was 19 and the oldest 72.

The ages at the time of operation are grouped as follows:

Between 19 and 20	3
Between 21 and 30	37
Between 31 and 40	48
Between 41 and 50	79
Between 51 and 60	94
Between 61 and 70	34
Between 71 and 72	5
Total	300

When the histories of these cases were studied they were found to have had symptoms of gall-bladder disease for periods ranging from a few months to 30 years, the average duration being 8 years and 3 months. Frequently it was noted that the first symptoms of gall-bladder disease began 15 years before admission to the hospital. This would indicate that gall-bladder infections occur most often in early adult life.

Sex. Sex has a decided influence on inflammation of the gall-bladder and bile ducts. In these 300 cases, 52 were males and 248 were females, a proportion of the latter as nearly 5 to 1. The reason for this is probably due to the fact that there are more conditions which favor the stasis of bile in women than in men. Chief among them are pregnancy and any constriction of the waist. 52% of the 248 women had borne children.

Exciting Causes. The exciting cause of cholelithiasis is known to be a bacterial infection of the bile ducts and gall-bladder in the presence of a stasis of bile. Rosenow's work at Rochester indicates that this infection gains entrance to the gall-bladder, not by extension from the duodenum, but through the blood, lodging first in the submucous layer. The action of the bacteria causes an increase in the cholesterin and the deposition of bile salts, especially calcium. 84, or 28%, gave a history of some previous serious infection.

Condition at Operation. At the time of operation there was acute inflammation in 89, chronic inflammation in 208, and cancer in 3. Stones were present in 72 of the acute cases, 137 of the chronic cases, and all of the 3 cancer cases. In other words, 29 2/3% showed acute cholecystitis, 69 1/3% showed chronic, and 1% cancer. The gall-bladder was drained in 160 and removed in 137 cases. There were operations on the common duct in 15 cases. The gall-bladder had been previously removed in 2 cases and not disturbed in a third, owing to the nature of the case; 12 of the cases had stones in the common duct as well as in the gall-bladder. A history of jaundice was given in 42%.

Previous Operations. Sixteen returned for a second operation for recurrence of symptoms. It is interesting to note that all of these were patients whose gall-bladders had simply been drained at the first operation and not removed. In 8 of the 16, stones were found at the second operation. The time elapsing since the first operation varied from 5 months to 15 years; the average being 5 years and 3 months.

This brings up the question of recurrence of gall-stones after operation, which is believed to be exceedingly rare, although calculi may form about a suture or other foreign matter left in the gall-bladder at operation. Usually, however, recurrence implies not a new formation, but that some stones were overlooked at the first operation. In the cases in this series, as in others that have been reported, it is probable that the stones were present but not found the first time. While freedom from recurrence is the rule, there are undoubted cases of new formation of stones, as in a case reported by Deaver,[1] from which, after he had removed a hundred gall-stones, another surgeon removed over 200 stones from the same gall-bladder only a few months later. Two hundred calculi could hardly have been overlooked at the first operation.

Mortality. As nearly as can be ascertained, the total number of patients who have died since operation is 28. Of this number, 7 died in the hospital, an operative mortality of 2.3%; two of these had carcinoma of the gall-bladder. Two died from general peritonitis and one from each of the following: acute pancreatitis, septic endocarditis, general septicemia, pulmonary embolus and diabetic coma. Four of the 7 had the gall-bladder drained, while the other 3 had cholecystectomies. Of the 21 deaths that occurred after discharge from the hospital, the cause of death, as far as could be ascertained, in 3 cases was due to gall-bladder complications, and in 18 to other causes. In 8 instances the exact cause was not known, but was evidently not of gall-bladder origin. Besides the 7 who died in the hospital, 2 died within 1 year after, 7 from 2 to 3 years after, and 8 more than 3 years after operation. In 5 instances the date of death is not known.

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* Read before the Bristol South District Medical Society, May 19, 1917.

Associated Lesions. In considering other surgical conditions present at the time of operation, it was found that 177 had other pathological lesions within the peritoneal cavity. Chief among these was appendicitis; 6 of which were removed for acute inflammation, and 111 incidentally and for chronic inflammation. There were various pelvic troubles in 33, or 11%; myomata of the uterus were present in 12, or 4%, which is rather lower than some observers have found. The next commonest lesion was umbilical hernia, present in 3%.

Post-operative Results. Of the 16 that had more than one operation for gall-bladder difficulties, the primary operation had been cholecystostomy. Eleven were done at this hospital and five elsewhere. The second operation, performed in 15 cases, was to remove the gall-bladder, and in 4 to drain the common duct. There was no operative mortality in these 15 cases. All are now living except one who died of pneumonia 4 years after operation. The sixteenth case was operated on elsewhere.

Our follow-up system has succeeded in tracing 271, or 90 1/3%. Of the 160 cholecystostomies, 133 were traced, and of these 55% were cured, 32% were improved and 13% were not improved. Sixteen, or 10%, required further operative treatment. Of the 137 cholecystectomies, 125 were traced, and of these 89% were cured, 6% were improved, and the remaining 5% consider themselves unimproved.

The function of the gall-bladder, if it has one, has never been satisfactorily explained, though many theories as to its purpose have been advanced. Physiologists have maintained that the chief function is the storage of bile until needed for digestion; but this seems improbable when one considers the quantity of bile produced in 24 hours. J. B. Murphy proposed the ingenious theory that the gall-bladder is like the secondary bulb in a bellows, and serves to maintain an even pressure in the ducts, thereby preventing a backing up of bile in the hepatic duct. Mayo[3] has suggested that the gall-bladder is an "obsolescent" stage of human embryology like the appendix.

Certainly, whatever part this organ does play in the body can be readily taken over by the bile ducts. In fact, this has already been done by nature in many cases before the patient is operated upon. These are the cases in which the gall-bladder is found distended with mucopurulent fluid and detritus, in which the cystic duct is obstructed or even obliterated with no evidence of the presence of bile in the gall-bladder for some time previously.

Judd's recent work on "The Effect of Removal of the Gall-Bladder" is, indeed, a most valuable contribution. He shows that after cholecystectomy all of the ducts outside the liver dilate, chiefly due to the sphincter at the entrance of the common duct into the duodenum; and that this sphincter can withstand only a small percentage of the pressure which it normally maintains after the gall-bladder has been removed. Also that when the muscle fibres are dissected free from the intramural position of the duct, the biliary tract does not dilate after cholecystectomy.

The pendulum of opinion has swung far to the side of cholecystectomy in the last few years. Formerly cholecystostomy was the operation of choice, now cholecystectomy is strongly advocated by men who previously advised drainage of the gall-bladder.

Cholecystostomy and removal of stones cures symptoms of mechanical obstruction, but does not cure cholecystitis, nor can it restore the damaged wall of a gall-bladder.[5] Therefore cholecystectomy would seem to be indicated if the best results are to be obtained; for infection which gives symptoms is almost always present in the wall of the gall-bladder, if not in the bile itself.

While it may be said that there are no well-defined principles which can invariably be followed in the management of gall-bladder operations, yet the operation of cholecystectomy is consistent with the underlying principle of all surgical procedures, which has always been and still is the removal of the offending member.

REFERENCES

[1] Deaver and Ashhurst: Surg. Upper Abdomen, Vol. ii, p. 113.
[2] Lane: Jour. A. M. A., Vol. lxv, p. 1912.
[3] Mayo, W. J., and C. H.: Keen's Surgery, Vol. iii, p. 991.
[4] Judd and Mann: Surg. Gyn. and Obs., Vol. xxiv, No. 4, p. 437.
[5] Mayo, C. H.: Jour. A. M. A., Vol. lxv, No. 3, p. [illegible]

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General Manager of American Red Cross.—Harvey D. Gibson, president of the Liberty National Bank of New York, has volunteered to give his entire time for the duration of the war to the Red Cross without compensation. He will act as general manager, and will take over much of the work of consolidation and coöperation hitherto performed by Eliot Wadsworth, whose entire time has now been given to his duties as member of the War Council.

Industrial Hygiene.

OCCUPATIONAL DISEASES IN MASSACHUSETTS.

By Thomas F. Harrington, M.D., Boston,
Medical Deputy Commissioner of Labor.

The value of reporting industrial diseases, as required by the State Board of Labor and Industries, increases greatly as occupational life becomes better recognized as a factor in ill health, accidents and deaths among the army of wage-earners in this State.

Massachusetts offers exceptional opportunities for the recognition and study of occupational diseases because of the great diversity and multiplicity of its industries.

The reporting of industrial accidents required by the Compensation Law has centered medical attention upon that aspect of occupational hazard generally. The data show, however, that there is from six to seven times the loss in wages, sickness and ill health annually because of occupational diseases than that rising out of industrial accidents. The startling and tragic nature of the accidents, as well as the fact that their abolition and their "follow up" are a matter of business with insurance companies, have given to this group of hazards a prominence not yet achieved by industrial diseases.

Hospital physicians and surgeons in many centers are giving much time to the consideration of the occupational factor in their diagnoses of patients referred to the hospitals. This emphasis has resulted in many surprising discoveries in etiology, and has excited wide interest in industrial problems. The industrial managers have recognized the economic as well as the efficiency value of preventing occupational hazard to health, limb and life of their employees, and many establishments throughout the State are now under medical supervision and guidance.

The Massachusetts Workmen's Compensation Commission has recognized lead poisoning and other diseases as occupational conditions for which compensation may be obtained. All this interests the general practitioner. The trend of industrial insurance is towards granting to the wage-earner a free choice of an attending physician in industrial accidents. This undoubtedly will be extended to insurance against industrial diseases. The majority of practitioners have had very little opportunity to study industrial processes and their hazards. There is, however, nothing in the field of industrial life that affects the health of the workers that should call for the development of this branch of preventive medicine into a specialty.

It is a difficult matter often to say definitely that any particular affection is due exclusively to some toxic substance used in the process of manufacture. Neither is it always possible to estimate correctly all the phenomena associated with a severe occupational intoxication. Nevertheless it is possible for every physician so to acquaint himself with occupational hazards that he suspects industrial poisoning when a particular group of symptoms present themselves, and consequently directs his examination of the patient accordingly. Many sicknesses due to industrial poisons simulate, almost identically, illness due to an entirely different cause. As an illustration, it might be cited that there is little to guide the physician, so far as symptoms are concerned, in a case of nephritis or of gastritis, or of nervous affections due to toxic substances, and those due to causes far removed from occupational exposure. The patient's statement is of little value at times as he seldom knows more than the trade name of the toxic substance used. He may, however, furnish information that other workers are affected similarly. Here, however, the physician must be guarded against simulation—not malingering—by the employee, as many of the phenomena of industrial intoxication are subjective. Neither the length of time employed nor freedom from previous attack while at work in the same industry are evidences against a diagnosis of industrial toxemia, as susceptibility and immunity, natural or acquired, are factors of the greatest importance in the whole group of industrial diseases.

The workers and their families, the industrial managers and the insurance companies, all expect the general practitioner to be as familiar with the signs and symptoms of industrial diseases as with those in any other disease. Today the State requires accurate data and information on these questions in its legislative remedies, to distribute the cost and burden of industrial human wastage. It relies upon the medical profession to furnish these factors.

Not infrequently many of the illnesses and diseases met in the consulting room and in the sick-room are the results of occupational conditions, recent or remote. To overlook this cause is to treat symptoms only; to appreciate it is a long step toward accurate diagnosis. Every physician sees patients daily complaining of muscle, nerve and organ irritation due to conditions dependent upon overuse or abuse of the structure concerned in occupational duties. So, too, anemias, fatigue, headaches, eye strain, nose and bronchial irritation, all rising out of or aggravated by overheated workrooms, devitalized dusty atmosphere, lack of toilets and of drinking and washing facilities. When to these conditions are added poisonous dusts, fumes, gases and mineral substances, we have a series of causes that are direct and primary in much of the ill health among industrial workers. The more dramatic causes of this ill health, however, are the ones most generally recognized. This list is growing in Massachusetts.

During the year 1916, there were 182 cases of occupational diseases reported to the State Board of Labor and Industries. Seventeen of these cases proved fatal. This list included:

Diseases	No. Reported	No. Deaths
Anthrax	27	4
Benzol poisoning	8	5
Brass poisoning	1	
Caisson disease	15	
Fume and gas poisoning:		
Carbon monoxid	7	1
Hydrogen sulphid	1	1
Nitrous acid gas	4	2
Sulphur disulphid	1	1
Tri-nitro-toluene	3	2
Wood alcohol	1	
Lead poisoning	112	
Miscellaneous	2	1
Total	182	17

The following summary shows that the recognition of industrial diseases is receiving the attention of an increasing number of physicians:

Cases Reported	Oct. 1916	Nov. 1916	Dec. 1916	Jan. 1917	Feb. 1917	Mar. 1917	Total
Lead poisoning	11	17	13	26	25	26	118
Brass poisoning		2		16			18
Wood alcohol		1				1	2
Aniline oil			1		1	1	3
Nitrous fumes	1	1					2
Phenol poisoning						1	1
Carbon disulphide						1	1
Caisson disease		1	2		1		4
Anthrax			3	1		2	6
Total	12	22	19	43	27	32	155

Each case of occupational disease reported to the State Board of Labor and Industries is investigated by an Industrial Health Inspector of the Department. This investigation includes a sanitary inspection of the place of employment and a description of the process of manufacture, including a tabulation of each poisonous substance used and the nature of the dust, fumes and gases generated in the process of manufacture. Many fatal cases have been brought to autopsy by the medical examiner of the district. A description of some of the various industrial diseases met in occupational life in Massachusetts will be considered in subsequent papers. The point that should be brought home to every practitioner of medicine in this State is the necessity today of recognizing occupational life as a possible source of many of the conditions of sickness and ill health prevailing among industrial workers, and, secondly, that industrial hygiene offers an exceptional opportunity for applying most effectively the truths of preventive medicine.

The State Board of Labor and Industries is most anxious to coöperate with physicians, employees, and manufacturers in reducing the hazards to health and life in industrial establishments.

The following summary of the work of the Department for the year 1916 shows to what extent this coöperation is possible:

More than 30,000 inspections of industries were made, and over 11,000 reinspections 12,000 orders were issued to correct conditions existing contrary to law. The inspectors visited 2300 homes of persons who applied for license to do work in the home. More than 3000 complaints against unsanitary and other working conditions were investigated and corrected. It was necessary to resort to prosecution in 360 cases. During the year the Board issued Rules and Regulations governing working conditions in foundries, in compressed air, in establishments where exposure to benzene derivatives is a factor in causing ill health, and rules for the protection against anthrax, as well as rules for safeguarding machinery. Circulars of instruction on the protection of injury to eyesight, and a circular on dangers to dust are being distributed throughout the industries. Rules have been formulated for the protection of workmen engaged in building operations.

In the creation of these various sets of Rules and Regulations for the protection of the employees, the Board had the coöperation of both employers and employees in formulating rules so as to meet best actual working conditions in the various industries affected by the Rules.

Copies of any of these publications will be sent to any physician desiring the same by applying to the Board at its office, 1 Beacon Street, Boston.

Medical Progress.

REPORT ON DERMATOLOGY.

By John T. Bowen, M.D., Boston.

X-RAY IN HYPERTRICHOSIS.[1]

Freund of Vienna, in 1897, was the first to call attention to the removal of superfluous hair by the x-ray, reporting, together with Schiff, some more or less successful results. At first there was, as is usual with new methods, much enthusiasm displayed; later it was found that it was difficult to effect a complete cure, and that atrophy and telangiectases were a not uncommon result. Today there is a difference of opinion, some condemning the process unreservedly, others claiming that it has a place in certain selected cases. Pusey's judgment is concurred in by most dermatologists and roentgenologists, namely, that although practically satisfactory results can be obtained in about one-half of the cases, the results are so uncertain and the possibilities of harm are so great, that the treatment should be undertaken only in extreme cases, or with the understanding that if the exposures are kept within the limits of safety, the outcome is extremely doubtful.

In hypertrichosis of the face, the problem is to remove the hair permanently, without subsequent disfigurement. This is difficult, as the dose necessary for complete depilation is very likely to produce an erythema, which in turn in many cases is followed, perhaps, after a considerable interval, by telangiectases, atrophy and wrinkling. Many roentgenologists, while refusing to use the x-ray in facial hypertrichosis, apply it without hesitation for removing hairs from other parts of the body, such as the arms, legs, axillae, etc., as in these places a little atrophy would not be important. In the case of the leg, however, the extent of surface and its convexity render the method rather impractical. The use of a filter is decidedly desirable, from a cosmetic point of view. Coarse hairs are more readily destroyed than very fine white or lanugo-like hairs.

MacKee states that the medico-legal aspect of the treatment of hypertrichosis, especially of the face, is of very great importance, as malpractice suits have been relatively frequent; the verdicts are most often in favor of the defendant.

The writer's own views on the subject are that, although a perfect result is possible, wrinkling of the skin is very likely to result. It may be slight and of little cosmetic importance as compared with the preceding hypertrichosis, or it may be very disfiguring. Hence he advises against this method except in unusual cases. He warns against the danger from a medicolegal point of view, of yielding to the entreaties of excitable neurotic individuals, who are, perhaps, rendered almost insane from the worry caused by the deformity. It is better to try to dissuade the patient by explaining the tediousness, length of time, uncertainty and danger of the method, and a signed agreement in which the patient agrees to assume all responsibility, although of value, will not prevent the bringing of a suit for malpractice.

Radium has been advocated by Heidingsfeld and others. It will cause depilation the same as the x-ray, but it is suitable only for small areas, and these as a rule may be better treated by means of electrolysis. Although it has been claimed that radium may be used in these cases with perfect safety, the fact remains that a falling of the hair is produced by radium in exactly the same way as by the x-ray, and that the danger of complications and of disfigurement is about equal in degree. In all of these cases the possibility of idiosyncrasy must also be taken into consideration.

MONILETHRIX.

MacKee and Rosen[2] report six cases of this unusual affection of the hair, together with the results of their studies and investigations. Briefly, monilethrix is, with few exceptions, an affection of the hair either noticed at birth, or developing a few months subsequently. The hair becomes brittle and lustreless, and breaks off before it has attained any considerable length, and is attended with a condition of keratosis pilaris in almost all cases. The affection becomes more noticeable as the children grow older, and may involve the entire scalp, or only portions of it. The essential and notable feature of this disease is the condition of the affected hairs, for not only are they short, brittle and lustreless, but they are seen to be beaded at regular intervals, and the nodes are usually of the same size and shape. Contrary to what might be supposed, the thick part of the hair, or node, is the normal part, whereas the constricted part is the atrophic or pathological portion of the hair. Therefore, strictly speaking, it is improper to use the term "node." There may in some cases be more or less scaling of the scalp in addition and, after a time, a general atrophy. The patient's health is usually good, and there are no other congenital anomalies. There was a distinct hereditary influence in one case reported, 17 individuals in 5 generations of the same family being affected. While the causation of the disease is unknown, the tropho-neurotic theory is generally accepted. In certain reported instances, beaded hairs have been found in the eyebrows, eyelashes, bearded face and axillae, as well as in the pubic region. The affection was congenital in all of the author's cases, and in 10 of the complete reports found in the literature.

The histological findings of the various authors are much the same. There is a moderate or slight inflammation of the corium, a marked dilatation of the follicular orifices with a pronounced hyperkeratosis, giving rise to a horny plug. All the histological investigations have revealed nodes and constrictions in the follicular portion of the hair also. The papilla, bulb and matrix of the hair are normal.

Etiologically the microscopic findings do not afford us much light. A parasitic, mechanical and tropho-neurotic theory has, in turn, been advanced. There is nothing in support of the parasitic theory, and little in favor of the mechanical. The tropho-neurotic theory seems most plausible, the alternate thick and thin parts of the hair being explained by assuming an alternate normal and abnormal activity of the cells of the hair bulb, yet why the cells should not proliferate regularly it is difficult to explain. In favor of the view that the intermittent growth is due to some abnormal nerve control of the hair bulb itself is the fact that the moniliform condition has occurred after a mental shock, and epileptic seizures. Cases have occurred also after influenza. Behrend suggested that the thick parts of the hair were the growth during the day and the constrictions the growth during the night, and it may be that the loss of nerve control during sleep causes a temporary cessation or diminished activity of growth in the cells of the hair bulb. It has also been suggested that some vasomotor change at regular intervals in the hair papilla might account for the intermittent growth.

With regard to prognosis and treatment, various local stimulating agents have been tried, but without benefit. A temporary depilation by means of the x-ray was thought to have cured one case, but has failed in others. Spontaneous recovery has never occurred, although several writers have noted improvement as the individual grew older. In a word, at the present time the affection must be regarded as incurable.

PASTES.[3]

Pastes are mixtures of powders with fats, differing from ointments in the much larger amount of powder that is incorporated in the compound, and its consequently thicker consistency. Montgomery gives a good résumé of the indications for these preparations. The best known of the pastes is Lassar's, composed as follows:

Acid salicyl.	1.00
Amyl. maidis	12.50
Zinc oxid.	12.50
Vaselin.	25.00

This preparation, on account of the large amount of powder it contains, offers the advantage of porosity and absorbability to a greater extent than do ointments, and also adheres firmly to the surface of the skin, and acts as a protective. The salicylic acid is supposed to act as an antiseptic. This paste mass absorbs the discharges from oozing surfaces, and this effect may be increased, when the discharges are copious, by dusting boracic acid or talcum powder over the preparation. The paste must not be removed by force, but by the application of a bland oil, when this is necessary. Besides these oozing eczemas, the irritable papular forms often do well under pastes, as the latter afford protection and act as a splint. Pastes, unlike salves, do not tend to retain the heat of the skin, and prevent the evaporation of sweat, They are also valuable in the case of people whose skin is rebellious to any fats in the form of ointment.

Oxide of zinc and starch are the powders most frequently used in compounding pastes. Starch has been used to such an extent in Germany that one journal urged that it should not be employed in skin troubles during the present war on account of its value as a food. It has a particularly bland action on the skin, and is less drying than zinc oxide. A softer, smoother paste may be made up as follows:

Amyl. maidis	
Zinc oxid. āā	20.00
Vaselin.	60.00

Various medicaments may be added in powder form to these pastes, such as sulphur, naftalan, etc. Naftalan is a Russian coal tar product, a black mass of the consistency of vaseline, which may be made into the following paste:

Naftalan	50.00
Zinc oxid	
Amyl maidis āā	25.00

Now that the war has interfered with the supply of naftalan, tumenol, a mild antipruritic tar preparation, may be substituted in acute eczema in the strength of one to three per cent., in subacute eczema in ten. Montgomery recommends the following modifications of Lassar's paste in superficial inflammations:

Acid salicyl.	1.00
Amyl. maidis	12.50
Zinc oxid.	12.50
Glycerin.	25.00

This preparation is of the consistency and color of thick white paint, which spreads well, remains permanently in place, and does not soil the clothing. The preparations containing glycerine make the skin damp and clammy on account of its hygroscopic character, which is often an advantage in hot weather. Many people, however, have a distinct idiosyncrasy to glycerine, and in these cases it cannot be used. None of the pastes should be used on any of the hairy portions of the body. Montgomery has a good word still for the gelatine pastes, which were quite in vogue at one period. He thinks they are wonderfully effective in certain eczemas and ulcers of the leg, and in pruriginous affections in other places, where it is necessary to exclude the air and to protect the part from the injurious effects of scratching. He employs the following:

Gelatine	46.00
Zinc oxid.	28.00
Glycerin	12.00
Aquae	114.00

The water should first be heated and the gelatine dissolved in it, then the glycerine and zinc added, and stirred until cold. Before applying, the jar containing the preparation is placed in hot water to liquefy the contents, which are then spread on the part and covered, before they cool, with shreds of absorbent cotton. Very intensely pruritic eruptions are often controlled in this way.

THE RESULTS OF PERMANENT DÉCOLLETAGE.

Brocq[4] discusses the cutaneous effects of the fashion that has prevailed among women during the last three years, of exposing a triangular space on the neck and chest, of which the base is formed by the clavicles and edge of the sternum, and the apex is situated between the breasts. This custom has given rise to various alterations of the skin, since this structure is very delicate at the upper part of the presternal region, almost if not quite as much so as that of the face. When this region is exposed, without any protection, to the action of atmospheric agents,—air, wind, dust and sun, the skin may quickly become much altered. In those susceptible to certain dermatoses, this region may become a real *locus minoris resistentiae*, and may be the seat of a simple pruritus, of a circumscribed pruritus with lichenification, of various sensory disturbances, of a true vesicular eczema, and of seborrheic eczema or psoriasiform parakeratosis. The most common effects of the exposure of this region are, first, *pigmentary changes,* varying from a *café au lait* color to deep red or brown, sharply outlined, usually most pronounced at the centre or towards the base of the triangle. Sometimes this area is so deeply pigmented that complete décolletage is rendered impossible on account of the disfiguring contrast. *Circulatory disturbances* are next in order, consisting of a simple erythema or of a fine network of telangiectasis, similar to those that sometimes develop on the face. In a like manner, these vascular lesions of the neck and chest are sometimes subject to congestive flare-ups, when the region suddenly becomes excessively reddened, somewhat puffed up, and then gradually becomes more normal. These outbreaks may be due to external causes, or to emotion, digestive disturbances, etc. *Changes in the texture of the skin* are shown by an apparent thickening, dilatation of the pores, and loss of softness and polish. Occasionally it seems atrophied and glistening. A *keratosis* of the mouths of the follicles, a follicular cornification, giving the skin a rough and soiled appearance, sometimes results. *Acniform lesions,* consisting of comedones, or abortive papules and pustules are also common, and lastly *acute artificial eruptions* and *definite dermatoses* added to the traumatic lesions. The sterno-clavicular triangle is a region in which the normal resistance of the skin is especially weak, and hence an acute erythematous or vesicular dermatitis may be easily produced. Most women are ignorant of the fundamental principle that an inflamed skin should not be bathed with water, and especially not with soap and water, and should not be exposed without protection to the continued action of the air and sun. In this affection individual susceptibility plays an important part, as those exposed are affected in very varying degree. It illustrates the proposition that irritating external agents diminish the power of resistance of the skin in certain cases, so that dermatoses of internal origin may develop at these sites. It is an interesting question why this sterno-clavicular region is more readily irritated than the neck, which is subjected to the same external irritants with impunity. The writer thinks that it may be due to the special structure of the cutaneous tissues in this region. The skin here is extremely fine, quite vascular, stretched over the underlying bony structures, and rich in sebaceous glands; it is a favorite seat of seborrhea. It is much more like the skin of the face than that of the neck.

As to the therapeutic measures, protection of this region from all external contact is, of course, essential. Thin gauze or muslin coverings are not sufficient, a thicker, more compact dressing is required, and a thick paste, after the manner of Lassar's zinc oxide paste, should be spread on the skin, over which talcum powder is liberally sprinkled.

DIAGNOSIS AND GENERAL TREATMENT OF SYPHILIS.

Fordyce[5] read a paper with the above title at the Congress of American Physicians and Surgeons in Washington May 9 and 10, 1916. Fordyce's authority on the question of syphilis in this country is so great that his conclusions must be looked upon as of the utmost importance. He emphasized the importance of an early diagnosis of infection, and states that, unfortunately, clinicians are still met with who decry the modern methods of precision, and claim that the trained observer can determine by his eye and sense of touch all that can be revealed by laboratory procedures. That this position is a false one is shown by the fact that patients present themselves for syphilitic involvement of the central nervous system, an interstitial glossitis, or an aortitis, who had been told years before by the best known syphilographers that their lesion was only a chancroid, and that they had nothing to fear as to future results so far as this manifestation was concerned. It is well known now that the soft sore often contains the syphilis parasite, and that syphilitic manifestations from it often do not develop for two or three weeks, or are often entirely absent. Hence an examination for the spirochete should be made in every doubtful lesion, and if it is not found at first, repeated examinations should be resorted to, including the Wassermann reaction. It is often possible and of great importance to discover the parasite in initial lesions before the clinical characteristics appear, as early treatment and thereby a better prognosis may be rendered possible. The dark-field illumination is not difficult with a little training, and the syphilis parasite is easily distinguished from other organisms. Success in finding this is in great measure dependent on the care with which the serum is taken for examination—it should be from the depths of the lesion. In cases of doubt the examination should be repeated on successive days, avoiding the use of antiseptic washes, ointments, etc.

The time of appearance of the Wassermann reaction varies, in different individuals, from the fourth to the seventh or eighth week after exposure. It is usually definitely established with the appearance of the rash. It is emphasized that the treatment must be individual, as some patients treated under the older methods have a negative blood reaction, while others who have had numerous courses of salvarsan and mercury obstinately retain their positive reaction. In some cases it is impossible to convert a positive into a negative reaction, without endangering the patient's health. Fordyce insists that, although the interpretation of the Wassermann reaction is as important as that of the clinical phenomena, reliance must not be placed on its presence or absence alone. In cases of ocular, vascular, visceral or nerve syphilis, positive clinical signs may be present, while the Wassermann reaction is negative.

With regard to treatment, the object is the destruction of the greatest number of spirochetes in the shortest possible time. Experience has shown that this is best accomplished in the early stage, and by means of the combination of salvarsan and mercury. Salvarsan has little influence on the organisms in the test-tube, but is actively germicidal in the human body. It has been demonstrated empirically for many years that mercury has a curative effect in syphilis, and presumably this effect is a direct one. Potassium iodide has no effect on the early lesions of syphilis, and a very slight effect in rendering the Wassermann reaction negative. Yet it has a marked local therapeutic value, as in "gummata" and in periosteal lesions. Salvarsan is most useful in primary and secondary syphilis when the organisms are abundant, yet in gummatous and periosteal lesions and all the active manifestations of late syphilis, the drug is almost as effective therapeutically as in the early contagious period, especially in the case of persons who have been treated for years with mercury and potassium iodide, and have become more or less immune to the action of these drugs. Fordyce's method of treatment is to give a course of mercury with the salvarsan, the amount of each agent depending upon sex, weight, and general condition. The salvarsan is given in courses of 5 or 6 injections in doses of 0.3 gm. to 0.5 gm. for men, and 0.25 gm. to 0.4 gm. for women at intervals of one week to ten days. The mercury is given in the form of injections, in courses of 20-30 injections daily or every other day when the bichloride is used; once a week in a series of ten or twelve injections when an insoluble preparation is employed. Both salvarsan and mercurial courses are followed by a rest period of six weeks, and then the procedure is repeated. While frequent Wassermann tests are made, the treatment is not interrupted on account of a negative reaction, until the full amount has been given. When there are visceral lesions the salvarsan should be used in small doses, repeated at intervals regulated according to the individual case. When there are cardiac complications, mercury or mercury and potassium iodide should precede the injections.

With regard to the reactions following the use of salvarsan, Fordyce divides them into two categories, the immediate and delayed. In the immediate reactions, the symptoms usually come on during the injections, and are anaphylactoid in character probably. They are cyanosis, flushing, fullness in the head and slight dyspnea, with occasionally vomiting or attacks of severe pain in the lumbar region. The delayed reactions appear after twenty-four hours, three days or even longer, and are usually expressed by gastro-intestinal symptoms preceded by a chill and characterized by vomiting and diarrhea with increased temperature, or there may be simply malaise for a few days, and then active vomiting, fever, and a rash or jaundice, with, rarely, suppression of the urine. Fordyce warns against repeating the drug in cases where a dermatitis has been present, as he has seen in these circumstances an extensive exfoliative dermatitis develop, which ended in death. In his own experience there have been two deaths that could be directly attributed to salvarsan. Fordyce considers that it is important to examine the urine from time to time during the administration of mercury, inasmuch as this drug has a great affinity for the renal cells. It has been estimated that the toxicity of the different salts is proportional to the amount of pure mercury contained. Inunctions are very efficacious and safe, but unless in the hands of a professional rubber, uncertain. The results of treatment by intramuscular injections of mercurial salts are more rapid after the use of a soluble than an insoluble preparation, as the former is more quickly absorbed and exhibits less local reaction. The disadvantages of the injection of the soluble salts are that they have to be given daily, whereas the insoluble preparations form a dépôt of absorption and require to be administered at weekly intervals only. On the other hand, the insoluble salts have the disadvantage of exposing the patient to sudden absorption and mercurial poisoning.

Fordyce's conclusions are that the fate of the syphilitic individual depends upon the early diagnosis of his infection and the intensity with which treatment is carried out in the first six months, and that modern aids to diagnosis, such as the dark-field illumination and the Wassermann test, have proved of great service in the accomplishment of this purpose. The Wassermann test is of especial value in all conditions of obscure etiology, referable to the cardiovascular system, cerebrospinal system, or viscera, in which syphilis might be a factor, and in cases with obscure clinical symptoms, such as neurasthenia, febrile attacks, rheumatic pains, etc. But its interpretation requires as much training and experience as does the interpretation of the physical signs. In examination of the spinal fluid, the Lange or colloidal gold test should be performed in addition to the Wassermann reaction and a cytological and chemical examination. In secondary syphilis when the early rash is present and the Wassermann positive, it is best to employ first several injections of a soluble mercurial salt, followed by salvarsan. The possibility of an involvement of the nervous system should always be kept in mind in secondary syphilis. The most frequent symptoms are irregularity of the pupils, persistent headaches, and optic neuritis or auditory disturbance. The iodide of potassium has still a very important place. In tertiary syphilis with a persistent positive Wassermann reaction without involvement of the central nervous system, the iodide is very valuable, and its action on bone and periosteal lesions, accompanied by severe pain, is more rapid, both in relieving pain, and in reducing the neoplasm, than that of any drug in the pharmacopeia.

REFERENCES.

[1] MacKee: Journal of Cutaneous Diseases, March, 1917.
[2] The Journal of Cutaneous Diseases, June, 1916.
[3] Montgomery, D. W.: Journal of Cutaneous Diseases, August, 1916.
[4] Annales de derm. et de syph., May, 1916.
[5] American Journal of the Medical Sciences, October, 1916.

Book Reviews.

The Surgical Clinics of Chicago, February, 1917. Vol. I, No. 1; with 83 illustrations. Published bi-monthly. Philadelphia and London: W. B. Saunders Company.

The first volume of The Surgical Clinics of Chicago made its appearance in February, 1917, in the same general size, shape, printing and paper as the Murphy Clinics, which preceded it. The color of the binding is changed, but a much more important change is that it seems henceforth to be a publication of the combined Chicago hospitals, although a statement of this fact is lacking.

The contents of the February number consists of 12 chapters, by as many different surgeons. Many of the chapters consider more than one subject; all are admirably illustrated. The hospitals represented are: the Presbyterian, the Mercy, the Augustana, the Chicago Polyclinic, the Cook County, the Wesley and the North Chicago; and the surgeons are Drs. Arthur Dean Bevan, Albert J. Ochsner, E. Wyllys Andrews, Lewis L. McArthur, Dean Lewis, Carl Beck, D. B. Phemister, D. N. Eisendrath, Kellogg Speed, Edwin Warner Ryerson and Allen B. Kanavel.

The subjects vary widely; they include hernia, gall-stone disease, goiter, plastic surgery, nerve suture, gastric surgery, joint infections, transplantation of fascia lata in extrophy of the bladder, intracranial surgery, tendoplasty for wrist-drop, echinococcus cyst of the liver, and bone lesions.

It is obvious that the experiences of a dozen surgeons must, in the nature of things, be wider and more varied that that of any single surgeon, no matter how active the individual may be. In this way, the Chicago Surgical Clinics gives a wider field than its predecessor, and the same thing is true, to perhaps a greater degree, of the varying individuality of the men. A bi-monthly publication representing the best surgery of Chicago should certainly be extremely interesting and a valuable addition to our surgical libraries. It should become familiar to all active surgical practitioners and teachers.

The Surgical Clinics of Chicago. April, 1917. Vol. 1, No. 2; with 99 illustrations. Published bi-monthly. Philadelphia and London: W. B. Saunders Company. 1917.

The April number, of somewhat more than two hundred pages, contains fifteen chapters, written by as many surgeons, some chapters including several sub-headings. The contributors are Drs. E. Wyllys Andrews, Carl Beck, Arthur Dean Bevan, Carl Braden Davis, Frederick G. Dyas, Daniel N. Eisendrath, Louis A. Greensfelder, Albert Edward Halstead, Malcolm L. Harris, Allen B. Kanavel, Hugh McKenna, Arthur J. Ochsner, Nelson Mortimer Percy, D. B. Phemister, John Ridlon and David C. Straus.

As usual, the monographs cover a wide variety of subjects: they are well illustrated, and in most instances well written. They are always stimulating and offer many practical suggestions as to technic and surgical procedure. The publication is interesting and well worth reading.

Traumatic Surgery. By JOHN J. MOORHEAD, B.S., M.D., F.A.C.S., Adjunct Professor of Surgery, New York Post-Graduate Medical School and Hospital; Visiting Surgeon, Harlem Hospital; Attending Surgeon, Park Hospital; Adjunct Attending Surgeon, Post-Graduate Hospital; Chief Surgeon, Interborough Rapid Transit and New York Railways; Fellow, Academy of Medicine; Lieutenant, Medical Reserve Army Corps. With 522 original illustrations. Philadelphia and London: W. B. Saunders Company. 1917.

Moorhead's book is an extended, enlarged, well illustrated and comprehensive accident and injury manual. It has seven hundred and more pages; two hundred and fifty are devoted to fractures and dislocations—a proper and adequate proportion; on the whole, the treatment advised throughout the book is excellent. The chapter on Infections of the Hand is based upon the work of Kanavel; shock is viewed from the standpoint of Crile, not from the more recent work of W. T. Porter. This is unfortunate, since the latter has simplified both the conception of shock and its treatment. The book contains interesting chapters on the Traumatic Neuroses and Medico-Legal Phases, and X-Ray Burns.

The author has covered thoroughly the field which he has laid out for himself, and he has wisely restricted himself to this field. He has written a good book, which should become a favorite volume.

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THE DIAGNOSIS OF TUBERCULOSIS IN RECRUITS.

In view of the approaching assembling of the new armies under the draft, it becomes urgently necessary to consider the irreparable loss to the nation brought about by the undue proportion of tuberculosis in the classes which will come up for national service; and we have already commented editorially upon this subject in the issue of the Journal for July 12 (Vol. clxxvii, No. 2, p. 56). Among the masses of humanity from which selection will be made, there is a fixed number who have, or have had, pulmonary tuberculosis, and the problem for the examining surgeon is how to judge wisely and not include in the draft any individuals who could possibly be the subjects of latent infection. Diagnosis, often a most difficult matter in civil life, has evidently gathered new difficulties in the case of soldiers. For example, the known facts of tuberculosis—that infection, latent or acute, exists in most adults, that immunity is acquired, and that the number of non-fatal lesions increases with age—are somewhat difficult to reconcile with the rule of the army medical examination. Thus in England, stirred by the experience of France, the Recruiting Boards are forbidden to take into the army men "who have been under treatment in a sanatorium, and men who have been notified as suffering from tuberculosis." That the first should be rejected is clearly right, although ex-sanatorium patients have found their way into the army and have done good work: but it is asked, especially by French physicians, whether the rejection of all the notified men is quite consistent with the idea that tuberculosis is so universal as alleged, and that it is often healed or cured? It seems evident that, if physicians are prepared to accept the doctrine that 95% of adults have been infected, army examiners ought, in consistency, to accept the "healed" and even the "arrested" cases. Nevertheless, in England the rule rejecting them is rigid, but French opinion appears to justify the acceptance of the "healed" cases, if by "healed" be meant a cicatrized lesion, and not one that is continually passing into active tuberculosis.

There is another form of rejection which, in France, is regarded as seriously faulty in respect to diagnosis. We mean those cases classified as "suspicious," or rather, as tuberculous "suspects." According to Sergent, the diagnosis "suspected" tuberculosis indicates a small amount of concrete knowledge. Upon examination, most of these men turn out to be healthy, or instances of pleurisy, bronchitis, trench coryza, dyspepsia, mitral stenosis, simple fatigue of body and mind, with a few that are simply shamming. Examples of such diagnostic errors, resulting from a wrong interpretation of x-ray plates and physical signs, are so common in the records of the army clearing stations, or (*centres de triage*), that some examiners, like Rist, propose a sole criterion of tuberculosis and, therefore, a sole cause of rejection, and that is the tubercle bacillus in the sputum. This is too rigorous, and also throws open the door too wide; for the bacillus may not be found, and, on the other hand, there are physical signs which are sufficient. The most trustworthy, Sergent believes, are the following: dulness, hemoptysis, increased fremitus, "clicks," and a veil or shadow at the apices, fixed, not modified by cough, with striae and fly spots on the plate. These are evidences of a lesion of the parenchyma of the lungs. A pleural lesion shows the same veil or shadow, but it is movable; there is inequality of the pupil on the affected side, with friction sounds, and increased vocal fremitus, tracheobronchial adenopathy, and, curiously enough, tubular breathing, which in these cases is not a sign of pulmonary cavity, but of nasal obstruction. The x-ray pictures are telescopic; they show cavities not discovered by the most careful auscultation, but they do not enable us to ascertain whether a lesion is active or latent, whether it is pleural or parenchymatous, whether the disease is in a stage of evolution or of decline. Unfortunately this is a question of primary importance to the army surgeon.

The proportion of veils or apical shadows on radioscopy and on the x-ray plates was 63%. Apparently they are signs of healed lesions or of pleurisy of the apex. It is a significant fact that most of the recruits were rejected on this evidence; when reëxamined by experts at the *centres de triage* they were sent to the colors. This particular error is chiefly the work of examiners, who look at the men through the spectacles of the tuberculophobe. His tendency to see tuberculosis in every abnormal respiratory sign is a fallacy which may take root here. Many of the classical signs—harsh and rough breathing, weak breathing, and bronchophony,—have the misfortune, shared by most constitutional signs,—anemia, cough, fever and weakness,—of being somewhat equivocal. The evil may be overcome by careful preliminary definition and history-taking, but the man of routine, without time for individual selection, does not supply these things, and the original application of the words to a particular phase of bronchial disorder seems to have clung about them with a misleading effect. The result is that great numbers of sound men are rejected, and two classes of bugbears have arisen,—the true and the false tuberculous. As is usual with definitions and classifications, however, this distinction between true and false cases does not exactly represent the actual fact. True and false tuberculosis overlap and blend into each other. The diagnosis in all these cases is very difficult. It is a question how it is to be done without national loss through mistakes.

REPORT OF COMMITTEE ON SOCIAL INSURANCE.

In another column of this week's issue of the Journal is published in full the text of the recently issued Constitutional Convention Report (No. 327) on Social Insurance. To this majority report of the committee is appended also the minority report of one of its members. Both these documents should be of distinct interest to members of the Massachusetts Medical Society, many of whom have appeared at various hearings before the convention at the State House. The importance of this report is obvious in view of the bearing which it has on industrial health insurance in relation to the medical profession.

MEDICAL NOTES.

Swedish Health Rates.—Statistics of the population of Sweden for the year 1916 have been published, and the birth and death rates are the lowest ever recorded in that country. The birth rate per thousand was 21.14 and the death rate was 13.55.

Infantile Paralysis in Vermont.—There have been about eighty cases of poliomyelitis in Vermont this year. Because of the prevalence of the disease, Lieut. Col. Wolf, commander of the camp at Plattsburg, N. Y., has forbidden members of the garrison or training camp to visit Vermont without permission.

WAR NOTES.

Red Cross Unit for Roumania.—The sailing of a Red Cross unit to Roumania is announced. It is headed by Henry Watkins Anderson of Richmond, Va., who will make an investigation of the sanitary and health conditions of the country and institute relief work among refugees. A special appropriation of $200,000 has been voted to provide supplies of all kinds. The unit consists of twelve doctors and twelve nurses. One of the number is Dr. Francis W. Peabody of Boston.

Appointment of Boston Health Officer to Sanitation Camp.—Dr. M. Victor Safford, United States Health Service, who has served at the Boston immigration station for about fifteen years, has been ordered to Columbia, S. C., to serve in the sanitary department of the military camp at that location.

Boston Liner to Become Hospital Ship.—The *Prince Arthur*, for the last seventeen years running between Yarmouth, N.S., and the Port of Boston, has been commandeered by the British government to be used as a hospital ship. The *Prince George,* a sister ship, is already in English waters, having been taken over by the government for the same purpose a short time ago.

GIFT TO RED CROSS BY ELKS.—The Benevolent and Protective Order of Elks has voted to appropriate $1,000,000 to the Red Cross to be used in establishing base hospitals behind the firing lines, in taking care of the families of soldiers, and in aiding disabled men to learn a new trade or profession. The hospital units to be established by the Elks are to be marked with the name of the order and will be maintained by the Government and the American Red Cross. Each hospital staff will be made up of twenty-six surgeons, sixty-eight nurses and one hundred and fifty orderlies, and will cost about $60,000 to equip.

APPOINTMENT OF MASSACHUSETTS MEN AS NAVAL SURGEONS.—The following Massachusetts doctors have been recommended by Secretary Daniels to receive appointments as assistant surgeons of the navy: Thomas J. Kennedy, John W. S. Brady, Lewis W. Johnson, Roy J. Heffernan, Edward P. Bugbee, Joseph W. White, Francis E. O'Brien, Samuel Segal, Jr., Robert E. S. Kelley and Max H. Braff.

TRACHOMA IN THE ARMY.—The Public Health Service has issued a warning to recruiting officers to guard against accepting applicants who may be suffering from trachoma. Its contagious character and its capacity to blind invalid men are urged as reasons for refusing to accept men who have contracted it.

WAR RELIEF FUNDS.—On July 28 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$243,351.20
Armenian Fund	207,304.42
French Orphanage Fund	116,817.64
Surgical Dressings Fund	112,046.01
Serbian Hospitals Fund	99,591.82
War Dogs' Fund	861.25

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON. During the week ending July 21, 1917, the number of deaths reported was 184, against 189 for the same period last year, with a rate of 12.42, against 12.96 last year. There were 23 deaths under one year of age, against 37 last year.

The number of cases of principal reportable diseases were: diphtheria, [illegible]; scarlet fever, 16; measles, 74; whooping cough, 18; typhoid fever, 3; tuberculosis, [illegible].

Included in the above were the following cases of non-residents: diphtheria, 5; scarlet fever, 4; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 4; measles, 5; typhoid fever, 1; tuberculosis, 21.

Included in the above were the following deaths of non-residents: diphtheria, 2; measles, 2; typhoid fever, 1; tuberculosis, 2.

ADAMS NERVINE ASYLUM.—The fortieth annual report of the Adams Nervine Asylum, Jamaica Plain, states that the total number of patients under treatment during the year was 217, of which 47 were men and 170 women. There were discharged during this period seven as recovered, 107 as relieved, and 50 as not relieved. The training school has 16 pupil nurses.

BOARD OF HEALTH, Chelsea, Mass.—According to the recently published annual report of the Board of Health of Chelsea, Mass., the mortality rate for that city for the year 1916, was 14.40; excluding non-residents it was 10.02. The number of deaths under one year was 111, which is 16 more than last year.

The Massachusetts Medical Society.

WORKMEN'S COMPENSATION.

In accordance with the vote of the Council, June 12, 1917, namely: *Voted.* That a committee on Workmen's Compensation be appointed by the Chair, to consist of five members of the Council and one member from each District Society. The President has appointed the following committee:

A. N. Broughton, Jamaica Plain, *Chairman.*
M. A. Tighe, Lowell.
W. A. Dolan, Fall River.
John Warren, Boston.
F. W. Snow, Newburyport.
E. S. Osborne, West Dennis.
C. S. Chapin, Great Barrington.
W. Y. Fox, Taunton.
E. F. Cody, New Bedford.
W. H. Merrill, Lawrence.
W. T. Hopkins, Lynn.
F. A. Millett, Greenfield.
G. A. Moore, Palmer.
C. T. Cobb, Northampton.
D. C. Dennett, Winchester.
J. A. Mehan, Lowell.
G. W. W. Whiting, Somerville.
B. E. Hamilton, West Roxbury.
N. S. Hunting, Quincy.
F. E. Wheatley, North Abington.
E. L. Young, Jr., Boston.
E. L. Hunt, Worcester.
F. H. Thompson, Fitchburg.

WALTER L. BURRAGE,
July 26, 1917. *Secretary.*

Miscellany.

THE COMMONWEALTH OF MASSACHUSETTS.

Report of the Committee on Social Insurance.

The Committee on Social Insurance has had referred to it twenty-five resolutions and petitions, as follows:

Doc. No.

12. Resolution relative to the providing of non-contributory health insurance.
13. Resolution relative to the providing of non-contributory old-age pensions.
35. Resolution relative to providing for contributory old-age insurance.
36. Resolution relative to providing for contributory unemployment insurance.
37. Resolution relative to providing for non-contributory accident, sickness and invalid insurance.
38. Resolution relative to state pensions.
39. Resolution authorizing the Commonwealth to insure persons or property.
52. Resolution for a special tax to provide pensions for the aged and needy.
54. Resolution providing for a state fund for workmen's compensation.
107. Resolution to provide for social insurance by the Commonwealth.
108. Resolution relative to creating a state fire insurance fund.
109. Resolution authorizing compulsory insurance of employees.
110. Resolution authorizing state insurance of workers against accidents, sickness, invalidity, old age and unemployment.
111. Resolution providing for compulsory death benefits for dependents of persons engaged in the public service in times of war and national or state emergency and of persons engaged in hazardous employments at all times.
112. Resolution giving the General Court power to enact laws for the protection of the lives, health or safety of workers.
113. Resolution relative to creating a state fund for workmen's compensation insurance.
251. Resolution relative to the establishment of a system of non-contributory health insurance.
252. Resolution relative to the establishment of health insurance for workingmen.
253. Resolution relative to establishing a system of non-contributory old-age pensions.
254. Resolution relative to the establishment of a system of old-age pensions.
255. Petition of the Massachusetts State Branch of the American Federation of Labor, accompanied by resolution providing for the establishment and maintenance of a system of old-age pensions.
256. Resolution to empower the General Court to make absolute the liabilities of casualty insurance companies to persons injured by accident.
257. Resolution relative to pensions to dependents of those suffering from cancer or tuberculosis.
258. Petition of the Massachusetts State Branch of the American Federation of Labor, accompanied by resolution providing that employers shall insure in a public fund for the benefit of injured employees.
279. Resolution relative to the establishment of a state fund for workmen's compensation.

Of these, twenty-two may be described generally as dealing with some kind of social insurance or the machinery incident to its administration. One Resolution, No. 52, providing for a system of taxation to provide pensions for the aged and needy, would more appropriately be referred to the Committee on Taxation, and this Committee has been discharged from its further consideration. Another Resolution, No. 108, relative to creating a State Fire Insurance Fund, would more appropriately be referred to the Committee on Public Affairs, and this committee has been discharged from its further consideration. Another Resolution, No. 256, will be the subject of a separate report. This report deals with the twenty-two remaining resolutions upon the general subject of Social Insurance. The Committee does not consider that it is in any way charged with the duty of considering these propositions upon their merits but rather to determine if there is any doubt as to the constitutional power of the General Court to legislate upon all or any of them, and, if so, to consider the expediency of conferring such power upon the General Court, and if that question be decided in the affirmative, then to suggest such amendment or amendments to the Constitution as may be necessary to effect the purpose.

First.—As to the power of the General Court under the Constitution to legislate upon any of these propositions.

The Committee is not disposed to argue this question; indeed, any conclusion it might reach would, of necessity, be inconclusive. The Committee, however, is unanimous in believing that doubt does exist and contents itself, upon this point, with quoting from Bulletin No. 18, pp. 22, 25, prepared by the Commission of the Convention, as follows:

> Without inquiring too curiously whether the Massachusetts Supreme Court would uphold the constitutionality of a compulsory workmen's compensation act in the absence of a constitutional amendment, it seems proper to state that social insurance legislation, if compulsory, would be best safeguarded by an express constitutional amendment.
>
> . . . .
>
> In view of the recent Federal decisions referred to in this Bulletin it is obvious that "constitutional rigorism" is at an end and that the Fourteenth Amendment to the Constitution of the United States does not stand in the way of State legislation respecting health, unemployment and old-age insurance. Of course the question still remains as to whether such measures are in violation of the provisions of the Constitution of Massachusetts.
>
> That doubt could be removed by the adoption of an amendment expressly conferring upon the Legislature authority to provide for the several forms of social insurance herein considered.

Second.—The Committee is unanimously of the opinion that the Legislature should have the power to deal with these subjects in such manner as, in its wisdom, it may see fit.

> The "police power" has, in recent years, been greatly enlarged to meet changing conditions. As the Supreme Court has said:
>
> "Of course, it is impossible to forecast the character and extent of these changes, but in view of the fact that, from the day Magna Charta was signed to the present moment, amendments to the structure of the law have been made with increasing frequency, it is impossible to suppose that they will not continue and the law be forced to adapt itself to new conditions of society, and particularly to new relations between employers and employees as they arise."

The Legislature has for many years shown a disposition to deal with the questions involved in the Resolutions that are before us. In 1887 it passed the Employers' Liability Law, the first to be enacted in the United States. In 1903 a commission was appointed to investigate the relations between employer and employee. The commission reported in 1904 with a draft of a compensation act which was not enacted into law. In 1907 a joint special committee was appointed to sit during the recess of the General Court to consider Workmen's Compensation among other questions. As a consequence, a voluntary law was enacted in 1908 and amended in 1909. In 1910, a commission was created "to determine upon a plan of compensating employees for injuries received in the course of their employment." This resulted in further legislation.

Chapter 127 of the Resolution of 1907 provided for a commission to investigate and consider the various systems of old-age insurance or old-age pensions or annuities proposed or in operation in this Commonwealth, or elsewhere, and to report upon the advisability of establishing an old-age insurance or pension system in the Commonwealth. This commission made its final report on January 15, 1910. It is very voluminous and is House Document No. 1400.

Chapter 106 of the Resolves of 1913 provided for the appointment of a committee to investigate the subject of pensions. The commission was known as the Commission on Pensions, and was to report in detail on the various systems under which pensions were then paid by the Commonwealth and by the counties, cities and towns therein, and to what persons and the amounts thereof. The Commission recommended, among other things, the advisability of a service pension plan under which the persons to whom pensions should be granted should make payments from their salaries or wages, and should consent to deductions therefrom as contributions to the fund from which pensions should be paid, and made a very voluminous report under date of March 16, 1914, House Document No. 2450.

Chapter 120 of the Resolves of 1914 provided that, for the purpose of securing information for the General Court for a proper consideration of the subject of old-age pensions, the Director of the Bureau of Statistics be required in connection with the taking of the decennial census in the year 1915 to transmit certain statistical information to the General Court, including the number of persons 65 years of age and over within the Commonwealth, and their length of residence, the number of dependent persons of all ages being supported in the various public and private institutions throughout the Commonwealth, the number of persons of all ages in the various cities and towns of the Commonwealth who are receiving aid from any public source; also the number of persons aided from private sources, and any other information which, in his opinion, might promote the purpose of the inquiry. This report was made December 15, 1916, and is full of detailed information on this subject.

Chapter 157 of the Resolves of 1916 provided for the appointment of Special Recess Commission on Social Insurance, to study the effects of sickness, unemployment and old age in Massachusetts, to collect facts as to actual experience with the several forms of insurance therefor, and to recommend to the General Court such legislation as it might deem practicable and expedient to protect the wage-earners of the Commonwealth from the burdens of sickness, unemployment and old age, or any one or more of these. Subsequently, the duty of making a further special investigation was laid upon the Commission by Chapter 164 of the Resolves, approved June 2, 1916; namely, the subject of reasonable restrictions in the hours of labor in industries operated continuously for twenty-four hours, and to make such recommendations and drafts of proposed legislation as it might deem practicable. The report of the Commission, which was very voluminous, was presented to the General Court in January, 1917, and is known as House Document No. 1850.

A Joint Special Committee on Workmen's Compensation Insurance Rates and Accident Prevention was appointed under joint order of the Senate and House of Representatives, adopted June 2, 1916.

The purpose of the Legislature in providing for the appointment of the committee was outlined in its order as follows:

> . . . to investigate the subject-matter contained in the message of his Excellency the Governor, printed as Senate Document No. 444, with special reference to the problems of rate making and accident prevention under provisions of Chapter 751 of the Acts of the year 1911, known as the Workmen's Compensation Act, and acts in amendment thereof and in addition thereto.

The Committee made its report in February, 1917, Senate Document 370.

We next come to the address of his Excellency, the Governor, of January, 1917, in which he urged upon the Legislature the consideration of certain forms of social insurance, and specifically recommended the establishment of a compulsory system of Health Insurance which should include members of the family and also urged that an annuity should be paid by the State and its subordinate governments without contribution to its deserving citizens seventy or more years of age who do not have children able to support them nor an income of more than $200 a year, and who have been residents of the Commonwealth at least ten years.

Under Chapter 130, May 25, 1917, a special Commission was appointed, which is now sitting, known as the "Commission on Social Insurance," for the purpose of further investigating the extent to which poverty occasioned by sickness may be alleviated, medical care for wage-earners and others of limited means may be provided, and measures to prevent disease may be promoted, by insurance. The Commission is to undertake such investigations as to the health of wage-earners and the conditions under which they work, and as to existing systems of mutual, stock, fraternal, state and other forms of insurance in this Commonwealth and elsewhere as may be necessary to provide a sound basis for its recommendations, and is to submit a report, including drafts of any legislation which it may recommend to the next General Court, not later than the fifteenth day of January next.

The Committee has referred, perhaps, at too great length, and perhaps inadequately, to the investigations, past and present, of these subjects by the Legislature, not for the purpose of proposing any inquiry into the merits of these propositions, but to make it clear that through many years and at great expense, the General Court has provided for a careful study of the many intricate questions involved in the general subject of Social Insurance. It would, therefore, seem highly inexpedient that the suggestion of unconstitutionality should be permitted to attach to any measure the General Court may see fit to pass as a result of its prolonged and repeated investigations of the subject.

In Chapter I, the Legislative Power, Section I, The General Court, Art. IV, is found the following language:

> And further, full power and authority are hereby given and granted to the said general court, from time to time to make, ordain, and establish, all manner of wholesome and reasonable orders, laws, statutes, and ordinances, directions and instructions, either with penalties or without, so as the same be not repugnant or contrary to this constitution, as they shall judge to be for the

good and welfare of this commonwealth, and for the government and ordering thereof, and of the subjects of the same, . . .

This article has been amended as follows:

In 1821, Art. 2, by giving the General Court power to create municipal government.

In 1912, Art. 41, giving the General Court the power to prescribe certain methods of taxation for wild lands. In 1915, Art. 44, giving the General Court the right to impose a tax on incomes at different rates on different kinds of property.

It is not easy, and perhaps is not wise, in the absence of knowledge of what may be done with other parts of the Constitution, to attempt more than to follow, in a general way, the form of the amendments above referred to. The Committee submits to the Convention, first, a general amendment which is believed to cover the various propositions referred to it, and, second, different amendments, each dealing with a specific subject.

General Amendment.

The General Court shall have power to establish systems of social insurance, including old-age pensions or insurance, pensions for physical disability arising from any cause, health insurance, maternity benefits, insurance against unemployment, and compensation to workmen or their dependents for injuries incurred by workmen in the course of or arising out of their employment. It may provide for medical care as well as a money payment and may require that the cost of any such system or systems shall be borne in whole or in part by the State or any civil division thereof or by the insured or by the employer. It may provide that claims may be adjudicated with or without a jury and that employers contributing to the compensation of injured workmen or their dependents shall not be liable to any other claims for loss or injury.

Workmen's Compensation.

The General Court shall have power to establish a system of compensation to workmen or their dependents for injuries incurred by workmen in the course of or arising out of their employment. It may provide for medical care as well as a money payment and may require that the cost of such compensation shall be borne in whole or in part by the State or any civil division thereof or by the employer. It may provide that a contributing employer shall not be liable to any other claim for loss or injury and that claims may be adjudicated with or without a jury.

Health Insurance.

The General Court shall have power to establish systems of health insurance, including maternity benefits. It may require that the cost of such pension or insurance shall be borne in whole or in part by the State or any civil division thereof or by the insured or by the employer.

Insurance Against Unemployment.

The General Court shall have power to establish systems of insurance against unemployment, and may require that the cost of any such insurance shall be borne in whole or in part by the State or any civil division thereof or by the insured or by the employer.

Old-Age Pensions and Pensions for Physical Disability.

The General Court shall have power to establish systems of old-age pensions and of pensions for physical disability arising from any cause, and may require that the cost of any such system shall be borne in whole or in part by the State or any civil division or by the beneficiary or by the employee.

Charles G. Washburn,
For the Committee.

MINORITY REPORT.

While I concur with the majority of the Committee in all other respects, I feel bound to dissent from its recommendations and so it becomes my duty to state my reasons therefor.

The members of our Committee were unanimous in the conclusion that if there is any doubt about the present power of the Legislature to act fully and freely in the field of Social Insurance, then we ought to recommend an amendment or amendments which would remove such doubt. We were also unanimous in the opinion that we should not include in such amendment or amendments any detail or specific matter which changing conditions might render of temporary application only. The power of Congress to deal as broadly as it has with interstate questions under the Federal Constitution is found in the absence of such detail and specific matter, and in the broad, general language of that instrument. Changing needs are most easily met under such a Constitution.

Therefore concurring as I do with the expressed opinions of the majority of the Committee on these points, I must be consistent and make my recommendations accordingly, so I recommend the adoption of the following amendment to the Constitution:

Amendment.

> Full power and authority is hereby vested in the Legislative Department to establish any system or systems of pensions, compensation or insurance for the reward, relief or protection of any person or persons and to make any provision for such fund or funds as may be required therefor.

Respectfully submitted,
John D. W. Bodfish.

A STATE TUBERCULOSIS WAR PROGRAM.

AN OUTLINE OF PROGRAM SUBMITTED BY THE SUB-COMMITTEE ON THE TUBERCULOSIS WAR PROBLEM OF THE ILLINOIS STATE COUNCIL OF DEFENSE.

The Sub-Committee on the Tuberculosis War Problem of the Illinois State Council of Defense shall consist of one member from each county in the state, with one or more members from each of the larger communities. The member from each county shall be known as the county chairman for his county, and shall be authorized to select the members of a county sub-committee, which will be charged with the work of preparedness required in the particular county.

The Program.

1\. *Increasing the Appreciation on the Part of the Military Authorities and the Public as to the Importance of Tuberculosis as a Wartime Problem.*

(*a*) The preparation of a brief on the importance of tuberculosis in the present war, including all available information relative to the experience of the warring nations of Europe, together with the means these nations have adopted to suppress and control the disease.

(*b*) Placing this circular in the hands of the state military authorities.

(*c*) Distribution of this circular as a means of arousing interest among civil public officials and those interested in tuberculosis work in the various communities.

II. The Development of Anti-Tuberculosis Machinery in Each County in Illinois.

(*a*) The creation of a county sub-committee on the Tuberculosis War Problem in each county of the state, of which the county chairman shall be chairman.

(*b*) Increasing the facilities of all existing anti-tuberculosis organizations now operating dispensaries and visiting nurse service.

(*c*) The development of dispensaries and visiting nurse service in all local tuberculosis organizations now organized, but relatively inactive.

(*d*) The creation of organization in all counties in which there is no tuberculosis organization and the immediate development of medical, dispensary and nursing service.

(*e*) Securing the coöperation of the State Medical Society and the county medical societies in the development of county dispensary and nursing service.

(*f*) Urging the State Department of Public Health immediately to establish its proposed Bureau of Tuberculosis; to establish standards of nursing, dispensaries and diagnosis for the various counties, and otherwise to coöperate in the plan of preparedness for the wartime tuberculosis problem.

(*g*) Urging the Illinois Tuberculosis Association to coöperate in the plan and to stimulate its affiliated local organizations to greater activity.

(*h*) Assisting in the financing of local tuberculosis preparedness by calling upon public-spirited and patriotic persons to support county organizations, and by urging county authorities, city councils and boards of education to finance visiting nursing and dispensary service so far as the laws will permit.

(*i*) That counties which have voted favorably upon the establishment of county tuberculosis sanatoria be urged to appropriate the funds necessary for nursing and dispensary service, such work to be carried out under the direction of the County Sanatorium Boards.

III. Improvement in Methods of Examining Recruits.

(*a*) Bringing to the attention of the Adjutant General and of the Surgeon General the importance of tuberculosis in the present war.

(*b*) The recommendation to military authorities of a list of "danger signals" or evidences suspicious of tuberculosis which should cause the recruit to be subjected to special and thorough examination.

(*c*) Tendering to the state military authorities the services of a volunteer organization made up of physicians expert in the diagnosis of early tuberculosis, whose services will be available upon demand.

(*d*) The recommendation to the Adjutant General and to the Surgeon General of more leisurely reëxamination of enlisted men in mobilization camps while still under the jurisdiction of the state.

IV. Closer Scrutiny to Detect Frankly Tuberculous Recruits.

(*a*) Recommendation to the Adjutant General and the Surgeon General to inquire as to the previous tuberculosis of the recruit or the history of diseases akin to tuberculosis or those frequently confused with tuberculosis.

(*b*) The collection of complete data as to all cases of tuberculosis, all deaths from tuberculosis and all tuberculosis history associated with those of enlisting age and placing same in the hands of recruiting officers.

(*c*) Encouraging the enforcement by local health officials of the existing rule of the State Department of Public Health requiring the reporting of all cases of tuberculosis by physicians.

V. Establishment of Tuberculosis Hospitals and Sanatoria.

(*a*) Selection in each county of isolated wards in general hospitals, to be conducted by those experienced in the care of tuberculosis, for returned soldiers actively sick with the disease.

(*b*) Selection in each county of a suitable tract of land and arrangement for water supply, sewage disposal and other sanitary installation which may be utilized when required, with temporary buildings, as camps or colonies for the tuberculous.

(*c*) Ascertaining the facilities of existing sanatoria, in or convenient to the various counties, to care for the increased tuberculosis of modern warfare.

(*d*) The speeding up of county sanatoria already voted in the several counties.

VI. Control of Tuberculosis in the Civil Population.

(*a*) Urging public and private charity organizations to increase allowances for relief in proportion to the buying power of money.

(*b*) Coöperation in all plans of food conservation and in encouraging food production by the poorer people.

(*c*) Coöperation with employers, especially those whose factories are under greater pressure due to war, for the improvement of factory conditions and looking toward periodic physical examination of employees.

(*d*) Recommendation to military authorities that returned tuberculous soldiers be not discharged from service until after the active disease has subsided.

VII. Creation of Medical Forces to Meet the Problem.

(*a*) Recommendation that physicians and nurses engaged in public tuberculosis work withhold themselves from military service until an urgent need may arise.

(*b*) That one physician, designated by the county medical society of each county, shall give special study and attention to the early diagnosis and treatment of tuberculosis.

(*c*) That training schools for nurses include the nursing of the tuberculous and visiting nursing service in their curricula.

(*d*) That all well-established dispensaries be utilized for the teaching of the early diagnosis of tuberculosis, and that medical students and physicians be encouraged to seek such instruction.

(*e*) That instruction in elementary social service and in tuberculosis be given to public-spirited lay women, that their services may be utilized in times of emergency.

◆

APPOINTMENTS.

Johns Hopkins University.—The following changes have been made in the staff of the department of anatomy of the Medical School: *Dr. Florence R. Sabin* has been promoted from associate professor of anatomy to professor of histology; *Dr. Lewis H. Weed*, from associate to associate professor in anatomy, and *Dr. Charles C. Macklin*, from instructor to associate. *Professor O. Van der Stricht*, of the University of Ghent, becomes lecturer in anatomy. *Dr. Edmund V. Cowdry*, associate in anatomy, has resigned to accept the professorship of anatomy in the Peking Union Medical College which is now conducted by the Rockefeller Foundation of New York. *Dr. Eldon W. Sanford* becomes assistant in anatomy.

◆

RECENT DEATH.

George Stanculeanu, a Rumanian physician, who had been in this country for a number of months on behalf of the Rumanian Government, died on July 16, at Stamford, Conn. Dr. Stanculeanu was laryngologist to the King and Queen of Rumania and was very successful in his native country. Upon the invasion of the German army, he was compelled to flee, leaving everything behind him. He and his wife were later sent to this country on a mission by the Rumanian government. He suffered from a mental breakdown and pneumonia caused his death. His widow survives him.

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Address.

THE COUNTRY DOCTOR AND THE HOSPITAL.*

By Nathaniel W. Faxon, M.D., Stoughton, Mass.

In the medical profession the country doctor is likened unto the private soldier. His virtues and his valor are often extolled by the generals of the city, but few or no suggestions for his betterment are made. His shortcomings are brandished before him by specialists and he is often humbled by the great in hospitals who fail to consider the many handicaps under which he labors. Partly because of a fancied superiority and partly because of real advantages in the shape of laboratories, hospitals, and ease of consultation, the general practitioner has been taught or has come to look with respect or envy, or both, upon the physician in the city. Having partaken of this envy during my own experience as a country doctor, I have tried to find some way of improvement, and by your leave will suggest the following as a possible step towards improvement.

For many years there has been a constantly growing conviction among doctors and the public that the old ways of doctoring are not the best; that modern medicine and modern life are outgrowing their older forms, and that "old lamps must be exchanged for new." This has taken form as regards the public, in various legislative enactments, such as the Employer's Liability Act, The Workmen's Compensation Act, and in the present agitation for sickness or health insurance. Among doctors suggestions have been made pointing out the advantages of group medicine with or without a hospital center or in some cases advocating state control of medicine, partial or complete.

At an address before a medical club in Boston some years ago, Ex-Pres. Charles W. Eliot stated that it was his belief that in the future "the practice of medicine would come to be divided between preventive medicine, surgery and the specialties," in this case classing internists as specialists.

In the last Ether Day Address Dr. Haven Emerson of New York said that "whether by organization, by endowment or by state employment, it seems to me that there must come a change in the basis of medical practice."

"The great fault," says Dr. Richard Cabot, "of English and German systems of sickness insurance is that they do not center themselves around organized groups of physicians, that is, around hospitals. They still rest upon the primitive conception of the doctor working alone, like the cobbler or peddler, not in organized groups." Dr. Hugh Cabot is even more dogmatic and is entirely convinced that group medicine must take the place of the individual, and looks forward to the development of group medicine with the hospital as its center.

The action of the legislature reflects a dissatisfied public, and quotations given above show a similar dissatisfaction among our profession. Both are searching for a solution. As my medical life has been in a country town, I may be pardoned for considering only what I believe to be applicable under these conditions. Group medicine with a hospital center we are familiar with only in cities and mainly as an organized charity. Its application to the country is really the subject of this paper.

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* Delivered at the annual meeting of the Plymouth District Medical Society, April 19, 1917.

Group medicine without a hospital center, or the voluntary grouping of several physicians, has become common in cities and has certain distinct advantages. It has been brought about by the division rendered inevitable by the rapid accumulation of knowledge. The general practitioner has been replaced by a group of specialists who, having pooled the results of their investigations, are able to come to a diagnosis with greater accuracy and also to provide more efficient treatment. It permits a gathering of apparatus for diagnosis and treatment beyond the means or use of any physician. It saves time for both doctor and patient; it also means less cost for the patient who, under this group system, may have the knowledge of many specialists for one fee.

On the other hand, there are obvious disadvantages. If incomes are pooled, so also must expenses, which increase rapidly with the group medicine system, be pooled and salaries must be paid. In other words, medicine ceases to be a profession and becomes a business. It means diminished personal relation to the patient; a real loss, although difficult to estimate in terms of money. Business is built upon advertising and the rigid collection of accounts, a thing doctors would desire but which at the same time we recognize would be taking advantage of others' misfortune. So while recognizing the efficiency of group medicine, we see that there are attendant evils that must be seriously considered.

I believe this kind of group medicine is distinctly a city product flourishing only under certain conditions and not transferable to the country. First—it requires suitable housing: a centrally located house large enough for several physicians, with offices, examining rooms, laboratories, etc.—something difficult to find in a town. Second—a habit among patients of consulting the physician in his office, which is not a strong feature of country practice. Third—a large population capable of supporting specialists in many divisions of medicine. I believe voluntary group medicine cannot be effective in the small town, but I also believe that the isolated general practitioner will work at an increasing disadvantage. *The collecting of group medicine around a hospital center is*, I think, the best solution of the problem; first, because centralization appears to make for better doctoring; and second, because a hospital offers a logical center, both from the doctor's and the public's viewpoint—a condition not brought about by voluntary grouping.

Any country doctor, I think, will agree that his greatest handicap is the lack of a hospital. To have to send accidents, surgical cases, seriously ill medical cases, etc., 5 to 20 miles away, is a handicap, both to patient and physician. To the patient it may mean the difference between life and death. A hospital is also useful for the treatment of cases hardly serious enough to be sent away and yet which are scarcely suitable for home treatment. The accessibility of a town hospital allows friends and relatives to visit frequently and without expense, an item which would overcome many a patient's opposition to hospitals.

Furthermore, a hospital means attendance without delay, and better attendance because it allows of equipment beyond the reach of any doctor, as well as the assistance of nurses and other physicians. The possession of an ambulance will suggest one of the minor advantages to those who live where there is none.

From the viewpoint of the doctor, it increases his own efficiency because it gives him better facilities to work with. What the factory is to the manufacturer, the hospital is to the doctor. It allows him to work to advantage and to attend many cases which otherwise must be sent away. The loss of a case in this manner may or may not mean loss of income; it does mean loss of experience to the doctor and gradually loss of the confidence of the community. By this I do not mean that any doctor should attempt to treat all his patients, but continued sending of patients to hospitals sometimes for grave disorders, sometimes for slight, gives a little sting to the slur that country doctors are merely animated guideposts. The habit of turning troublesome problems of diagnosis or treatment over to someone else leads to slackness in thought and action, with inevitable deterioration of ability. Routine hospital data simplify many apparently obscure conditions, and how foolish we feel when the interne remarks in scornful tones that the "doubtful case" we sent in was merely a simple appendix. How unsatisfactory to send a patient to a far-away hospital with an uncertain but honestly uncertain diagnosis, to receive vague and scanty reports as to diagnosis and treatment. "Dr. So-and-So operated, I think, for fibroid. Doing as well as can be expected." After two weeks we are permitted to do the final dressing and inspect the healed wound. Ah, but you are welcome to come to the hospital at 9.15 and see Dr. So-and-So operate on your patient. We have all done it, arrived promptly at the hour set, after strenuous exertions to see a few necessary cases before leaving home, rushed in to comfort our former patient, received his grateful thanks, and then spent hour after hour awaiting the coming of the surgeon who was unfortunately delayed. Do not misunderstand me on this. I am finding no fault with the hospital authorities and surgeons; this is a plain statement of conditions that confront the country doctor, and because of this he loses experience, he loses contact with fellow physicians and he drops behind because he cannot come in touch with medical progress. Rather a small, imperfect hospital in my own town than a modern model of medical and surgical perfection 20 miles away.

So much for the good effects of a local hospital for the individual, *i. e.*, the patient and the doctor. What now, will it do for the community? A local hospital centralizes the health organization of the community. It naturally becomes the headquarters and general meeting-place of all the physicians of the town. Time will not allow me fully to discuss the question as to whether all resident physicians of a town should be upon the staff. Permit me to state that in Stoughton we are agreed upon this as one of our foundation stones because of its manifest fairness.

Because of the gathering together of many patients it saves much time in attendance. It brings the physicians into more frequent contact with each other, with the natural interchange of ideas; promotes healthy discussion and frequent consultation, which, because of time saved, may be had at less or no expense to the patient. It prevents duplication and allows, as before stated, a greater equipment than can be privately supported. It provides a place for the care of accidents, with a central office for notification of accidents, preventing the confusion attending the usual summons sent for all the physicians in town. Operations can be performed by surgeons called as desired without lengthy transportation, with the family doctor in attendance, to the mutual advantage of patient and physician.

A local hospital furnishes a headquarters for the District Nursing Association, and a center from which to call for nurses needed outside, for it should not be supposed that I imply that all sick must be treated at this hospital.

A local hospital should further become the headquarters of the Board of Health. So that we have now centralized under one roof all that pertains to the health of a community—the physicians and nurses for the care of the sick and the Board of Health for the prevention of disease.

The health of a community falls under three heads:

1. The prevention of disease, which naturally is the province of the Board of Health.

   This includes;

   a. Prevention of communicable diseases.
   b. Prevention of industrial diseases.
   c. The correction of habits which determine or contribute to premature death.
2. Accidents.
3. Sickness.

The ideal Board of Health controlling an ideal community would be able to abolish all communicable diseases. Consider a community in which there was no tuberculosis, typhoid, malaria, yellow fever, etc.; no diphtheria, and rarely the infectious diseases of childhood; no syphilis or gonorrhea, and you will gain some conception of what preventive medicine aspires to. Consider the supervision of industries so that there were no cases of lead poisoning, phosphorus poisoning, or any evil effects from chemicals; factories with no dust, well lighted, properly warmed and ventilated, and you will further appreciate what preventive medicine means. Imagine a people who at last have learned that alcohol, drugs, tobacco, overeating (gluttony), overcrowding and unhygienic ways of living produce disease and premature death, and you will see what a campaign of education and teaching lies before us all.

After we have done all these things, when there are no infectious diseases, no sickness from unhealthy conditions, no disease from bad habits, there will still remain plenty for us to do.

Accidents will always come. "Safety first" may be the watchword, but there can never be immunity from accident. Cuts, broken bones, trivial and severe, will always be with us and demand treatment.

After we have reached the meridian in preventive medicine, we still must realize that life is fleeting and death is certain. Sooner or later prematurely or in the due course of time, some cause will bring sickness and finally death. Those causes that we can prevent we should. Every illness and every death that might have been prevented is our reproach, but those we cannot prevent we should try to ease and ameliorate, lessen suffering and perhaps prolong life and render it more comfortable.

Surgery may cure or relieve cancer, ulcer of the stomach or intestine, diseases of liver and gall-bladder, diseases of the genito-urinary system, abscesses and all the ills of the pyaemic bacteria, empyaema, hernia, goitre, etc.; medical advice and treatment may aid diabetes, nephritic condition, anaemia, rheumatism, arthritis, cardiac disease, pneumonia and other respiratory diseases, constipation and colds, apoplexy, paralyses, epilepsy, insanity and old age or the wearing out of the human machine. The puerperal state demands careful attendance, watchful waiting and intelligent direction and operation. These and many others, in our present knowledge, we may aid but not prevent.

To sum up, I believe that every town may have a hospital as the center of its health organization. There will be the headquarters of the Board of Health—directing the control of preventive measures. There will be the headquarters of the physicians and nurses for the care of those cases that cannot be prevented. In the hospital itself there will be cared for:

1. Those cases best cared for in hospital, irrespective of home conditions.
2. Those cases best cared for in hospital because of home conditions.

3. Those cases desiring hospital care because of its certain advantages.

As a center for the Board of Health: The effectiveness of a health board depends upon the energy and intelligence of its members and upon the co-operation of the physicians of the district. The weakest point, in my own experience, both as member of the health board and as an outside physician, was the lack of communication between the board and the town physicians. A common center where reports of contagious disease could be easily transmitted to all physicians, would go far towards bringing about greater interest in prevention of such diseases. This would naturally lead to greater interest in all preventive measures, to discussion as to methods of greater efficiency in preventive medicine along the lines previously mentioned. In other words, it not only would serve as a registry for sickness but also as a center from which to direct prevention of sickness.

As a center for the physicians of a town it places them in a position collectively to command the services of surgeons and specialists in a way impossible individually. How often have we desired aid given only by those who have specialized, yet, hesitating to send the patient to some out-of-town hospital, have still been prevented, because of expense, from calling directly upon a specialist for advice. A hospital could provide necessary equipment for diagnosis, could associate with itself consultants and specialists and appoint stated times for the examination and advice to patients brought by the attending physician. Fees under such circumstances could be made within the means of all.

Around such a center could be built up the regular hospital service caring for accidents and emergency calls, and the charity work of any district or town.

Allow me to quote a paragraph from an article of Dr. Hugh Cabot, that agrees with many of the suggestions I have made.

"I therefore look forward to the development of group medicine with the hospital as its center, such hospitals to be under the management of trustees, who, it is to be hoped, will take their duties more seriously than do most trustees of today.

"It will probably be objected that this will involve the treatment of all patients in institutions, but this will not of necessity result, unless it be thought desirable. There is no substantial objection to the hospital's staff making visits at any reasonable distance without loss of the important advantages of medical grouping. It does not even seem to me impracticable to conduct country practice in sparsely settled districts upon a hospital basis. It would seem to me entirely feasible to use the towns and smaller cities as centers from which medicine should radiate. The younger members of the organization would do the work in the outlying districts, living there, if necessary, but always keeping in close touch with their hospital center, and being promoted as experience and opportunity should dictate. It would thus come about that the younger practitioners would have thrown upon them the more laborious work, while the older members of the group would occupy the position requiring rounder judgment and fuller development, but neither the activity nor the enthusiasm of youth. We might in this way preserve all that is best in competition for that scientific achievement. We could undoubtedly permit the development of individuals along the lines best suited to their peculiar capacity, and get from each what he has best to give. We should avoid the scandals of inhuman charges and of indecent exploitation of suffering humanity by the sharks of the profession, and we might well avoid the tragedy by which the impecunious young doctor must select general practice, for which he is ill equipped, because he cannot afford to devote himself to the pursuit of pure science, for which he is best fitted."

I have now outlined a town hospital with a staff composed of all the resident physicians, who care for patients, within and without the hospital. How now can we reconcile community service with private competition?

There are three methods of organization to be considered.

1. Public. 2. Private. 3. Co-operative.

The public form is that supported by the community: state, county, municipal.

The private form is that supported by endowments from a single or from many sources.

Both are run without attempt at gain. They both admit and care for patients who are unable to pay for either hospital or medical care, and patients who pay what is supposed to be the actual cost of their maintenance, but who receive their medical attendance free. In some hospitals, a third class of private patients are admitted, who pay for both hospital and medical care. Naturally, only members of the staff may take advantage of this arrangement. Any physician holding a position on such a staff enjoys great opportunities. Although he may give freely of his time and skill to many without pay, he receives much in experience and renown and the opportunity to receive patients for pay, assisted by all the resources of such an institution.

This brings us to the third form of organization,—the co-operative: in towns where the community spirit is insufficient or such an organization seems undesirable or where it is impossible to raise sufficient funds to build and equip a privately subscribed hospital, it seems to me feasible, for the physicians of such a community, by means of co-operation and agreement, at least to make a start, however meagre, along this line, to their own and the community's advantage. Once the community is shown the benefits of such an arrangement, it will surely lend its aid. As to which form of organization is best, each community and each group of physicians must form their own opinion, governed by the existing circumstances.

In closing, let me sketch my own fancy of such a hospital group.

First of all, there must be the tangible hospital building, sheltering those dealing with the health of the community,—the board of health, the physicians and nurses, and providing a place to care for the sick. Ultimately, there will be gathered the offices of the physicians of the town, who will care for their own private patients in office and hospital, and for the charity cases of the town, according to whatever arrangement may be best, and whence they may go forth to the homes of those requiring attendance there. I will merely suggest here that such an arrangement would go a long way toward preventing the habit of some people in sliding from one doctor to another when their account had reached threatening proportions. There would be a central telephone desk with which all doctors would be in touch. Accidents (which are now usually a matter of chance, whoever happens to be within reach being the one to whom it falls) could be apportioned by a rotation system, or any system desired, to those wishing such calls. Duplication of apparatus and endeavor would be avoided; a central operating room and similar equipment would provide for all. A pathological laboratory would be feasible, the running of which would fall to that physician whose ability and inclination most fitted him for such work. Each physician would in the same way naturally follow that part of medicine in which he was most interested, thereby unconsciously and without loss of practice gradually becoming a semi-specialist. The possession of an efficient nursing corps, which could be called upon, whether in the hospital or for help outside, would be in itself a great aid in the care of sickness.

I hope my vision of such an organization is neither too socialistic nor too theoretical to be practical. I hope all here will express their views upon this subject, because only in this way may we achieve a thorough understanding and reach a definite conclusion.

Original Articles

A STUDY OF THE URINES OP PICRIC ACID WORKERS.

By F. O. West, M.D., Woburn, Mass.

The medical complaints of men engaged in the manufacture of picric acid having been treated in a general way,[1] this investigation was undertaken to determine the truth of the popular belief that the kidneys are seriously affected in those constantly exposed to this substance. If this belief is correct, the data collected illustrate what results may be obtained by a large manufacturing concern in preventing occupational disease. The means employed by this company in protecting its men are suitable working conditions and strict medical supervision. The building is properly constructed for the work to which it is put; ventilation and lighting are adequate; exits are well placed; washing facilities are numerous; and the foremen take an interest in the men under them. On the medical side of the problem, every effort is made to acquaint the men with the dangers of the substances they handle; signs are posted in conspicuous places, urging them to be cautious; emphasizing the need of personal cleanliness, and the importance of refraining from the use of alcohol. First-aid racks are numerous and are inspected several times daily to prevent supplies becoming exhausted. At the company hospital an attendant is present at all times during the 24 hours, and all men are urged to report there regardless of how slight an injury may be. They are required to report, as a matter of precaution, when there has been no accident, as in cases where there have been more than the usual amount of "fumes" in the building. It is reasonable to expect a minimum amount of trouble as a result of such care.

CONDITIONS UNDER WHICH TESTS WERE MADE.

Examinations were made on the urines of the entire crew of picric acid workers, including machine operators, packers; men handling the dried powder, and the steamfitters whose duties were confined to this department. They were all seen at the same period and while engaged at their regular tasks; the working conditions not varying from those present at other times. The results were compared with the findings of the preliminary examinations which all picric acid men must submit to before being hired, and with the examinations that were made from time to time during the course of their employment.

The crew was made up of both whites and negroes. The length of service varied from one to eighteen months.

On carefully questioning the men and consulting the detailed medical records kept in all cases, no evidence was found of a symptom-complex that could be attributed to picric acid poisoning.

In regard to poisoning by fumes of mixed acid, our records show that 30 of the 57 men thus examined had been temporarily affected. The number of attacks which these men had varied from 1 to 11; the great majority were mild, a few were severe, none were serious.

TESTS EMPLOYED.

The urines were examined for the presence of albumin and picric acid.

Albumin: The test used was heat and acetic acid with filtered urine. Picric acid: Three tests were applied to all urines,—white wool, copper sulphate, and potassium cyanide. These were checked with control tests worked out on both normal urines and normal urines with known percentage of picric acid in solution.

1. Wool. The material used was obtained from a skein of the best white wool. Strands were soaked in the solutions for 24 hours, thoroughly washed in warm water and dried. In this manner a control scale was made from urines with picric acid 1:40,000, 1:80,000, 1:100,000, and a normal urine. The first dyed the wool a bright yellow, the second a faint yellow, the third a very faint but easily distinguishable color, while the wool from the urine was a dingy white.

2. Copper sulphate test. Control tests were made on normal urines with known quantities of picric acid as in the above. The solutions were made alkaline with ammonia hydrate and an aqueous solution of copper sulphate (diluted until the blue color disappeared, a 0.2% solution) was added. A positive test was indicated by the appearance of a green color which was unmistakably given in urines having picric acid in dilution as high as 1:80,000.

3. Potassium cyanide. To urines with known amounts of picric acid, sodium hydrate and a small amount of a saturated solution of the cyanide were added, and the mixture heated. No result was given by the solutions of high dilution. The blood red color of this test appeared only when the strength of picric acid was increased to 1:8,000.

RESULTS.

As above mentioned, all these tests were applied to the urine of each man examined, and the results were compared with those given by the control tests as described. There was, however, a chance for error. This arises from the presence of picric acid on the hands of the men at the time of examination and the possibility of its being carried to the genitals and thus contaminating the urine as it was being voided. Furthermore, it was noted in many instances that picric acid was on the outside of the urine glasses after the men had set them down. In spite of this possible source of error, of the more or less constant exposure of the men to mixed acid fumes, of the presence of picric acid on the skin and about the nostrils, the following results were obtained:

Number of urines examined	57
Urines containing only albumin	4
Urines containing only picric acid	2
Urines with both picric acid and albumin	1

The albumin in all cases did not exceed in amount "the slightest possible trace." The amount of picric acid present, according to the gradations of the scale established by the control tests, was not stronger in any case than dilutions of 1:80,000.

ANALYSIS OF RESULTS.

Albumin: of the five men with albumin in the urine, two had shown it before they went to work in the picric acid department, the man with both albumin and picric acid being one of these. Although albumin in the urine is one of the reasons for rejecting men wishing employment, these men were accepted because of their otherwise unusually fine condition.

As regards the remaining three, their urines showed nothing wrong at their first examination. But I cannot find any evidence to warrant our attributing the albumin to the occupation: none of them had worked longer than five months; none had ever reported at the company hospital for "fume poisoning"; none had received any extensive acid burns; none had shown any acid dermatitis, and none showed any digestive disorders. Further to bear out this contention, additional data in regard to albumin in the urine were obtained from the medical records of former employees engaged in similar work. Twenty-nine men were thus investigated; they were taken at random and no effort was made to get selected cases. Length of service ranged from one week to ten months. In no instance was albumin present at the end of these periods. Moreover, of these twenty-nine men, seventeen had had fume poisoning; the number of attacks in each individual ranging from one to nine, with a total of 48, one being extremely serious, nearly resulting in death.

If the occupation causes irritation of the kidneys, we should expect to see evidences of it in those who had suffered ill effects, and not in those who had never been troubled by their work—a condition not discovered by this investigation.

PICRIC ACID IN THE URINE.

Two of the three men giving this test had been employed four months and the other fifteen months. The latter, a machine operator, was more liable to fume poisoning than the others. The first two were workers in the filter beds, and would be more likely to inhale the powdered substance. Nevertheless, none of these three men were more exposed to danger than any of the others, and they were not less cleanly. It is interesting to note that one man showing a great amount of picric acid about his nostrils had none in the urine.

RELATION OF PICRIC ACID TO ALBUMIN.

As only one of the three men showing picric acid had albumin also, and as the albumin in this case was present at the start, we cannot claim any ill effect on the kidneys from the picric acid.

SUMMARY.

The result of this investigation tends to show that picric acid may be manufactured without great hazard to the employee, provided the work is carried on under proper conditions and the men are subjected to rigid medical supervision. Of 86 urines examined for the presence of albumin, 3 gave the "slightest possible trace" at the end of employment, whereas it was not detected at the outset. Nevertheless, these three men had never been affected by any of the substances they were handling; while many men not given the test had been repeatedly treated, one of this latter class having nearly died from the effects of fume poisoning.

In addition to the examination for albumin, 57 of these urines were tested for the presence of picric acid, and three were positive.

Unfortunately, the value of this information is open to suspicion, on account of possible contamination. If the picric acid had been excreted in the urine in these cases, we find no evidence of its having caused renal irritation.

REFERENCE.

[1] Journal of Industrial and Engineering Chemistry, March 1, 1917.

AN EPIDEMIC OF DYSENTERY AT THE BOSTON STATE HOSPITAL, DUE TO A MEMBER OF THE PARATYPHOID-ENTERITIDIS GROUP.

By Mary Elizabeth Morse, M.D., Boston,
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AND
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[From the Laboratory of the Boston State Hospital.]

I. INTRODUCTION.

The so-called "asylum dysentery" still presents a problem as regards etiology, pathology and prevention. The finding of the Shiga bacillus in connection with numerous outbreaks has led to the assumption that it is always the causative organism. That other organisms may be concerned is demonstrated by the outbreak here reported, which occurred in the Infirmary Building of the Boston State Hospital in the spring of 1915. The cases were unusual, both clinically and bacteriologically, and therefore it seems of interest to report the epidemic. The severe cases were characterized clinically by acute dysenteric symptoms, and the fatal cases by septicemia and bronchopneumonia. The intestinal condition found in the autopsied cases was a widespread membranous ileocolitis. The cases of moderate severity had blood and mucus in the stools, without much prostration, while the mild cases had only diarrhea. The organism isolated in connection with the epidemic is a member of the paratyphoid-enteritidis group. In August, 1915, the disease reappeared in the Infirmary, and there was also an outbreak in the other buildings located near the Infirmary. Isolated cases occurred in the Infirmary during the winter of 1915-1916, and in the spring of 1916 small numbers in both the Infirmary and the Cowles Building. An effort was made to prevent the occurrence of the disease by prophylactic vaccination. Observations were made on agglutinin formation in the disease and after prophylactic inoculation. Skin tests were carried out with members of the paratyphoid-enteritidis group, and the leucocytic reaction was studied after prophylactic and therapeutic administration of vaccine.

II. EPIDEMIOLOGY.

The Infirmary is one of the buildings of the West Group, in which, as is seen by reference to Chart 1, are also the Cowles Building for chronically disturbed women, and the Fisher Building, containing wards for chronic men patients, officers' quarters, the kitchen supplying the entire West Group, and dining-rooms for the nurses and other employees of the Group; and, near the Infirmary, the cow and horse barns and the piggery.*

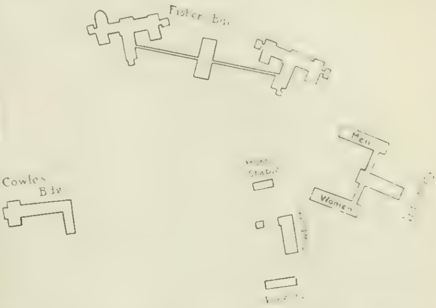

CHART 1. Buildings of West Group. Scale of feet: 100 = —|.

The first outbreak of the dysentery occurred in the Infirmary in April, 1915. In this building are about 380 patients, four wards each for men and women. The class of patients is limited to the elderly infirm and those having a chronic organic disease.

On the women's side the first case appeared April 15 and the last April 30. Eleven patients had the disease in a very severe form and of these six died. One nurse had a short but moderately severe attack, and three nurses had diarrhea.

On the men's side the first case developed April 24, the last May 13. There were eight cases, some quite severe, but none fatal.

The majority of the cases on the women's side came from a ward (V) on which the patients were up and about and some of them very untidy. The other cases, with one exception, appeared on the ward (VIII) to which those having the disease were transferred.

The first three cases occurred within three days' time and varied sufficiently in clinical signs so that they were not immediately classed together. The first appeared as a severe diarrhea in a very untidy senile dement; the second as a dysentery in an untidy paretic; the third patient showed lung signs twenty-four hours preceding the dysentery and died in five days. There was no autopsy. On April 20 the head nurse on Ward VIII, where these patients were isolated, had a diarrhea for one day, beginning twenty-four hours after the transfer of the patients to her ward. On April 25, when four more patients on Ward V had a dysentery, two nurses had a diarrhea, one of them being a night nurse working between Wards V and IV. On Ward IV a patient was taken ill with dysentery about two days later. As this patient had been cared for especially by the above-mentioned nurse, it is possible that she contracted the disease from the latter. On April 28, the last case on V developed, and on the thirteenth three new cases appeared on VIII.

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* During 1916 the piggery was removed to a remote location and cow barns closed.

In the earliest cases bacillary dysentery was ruled out by cultures from the stools. The clinical signs were so similar after the disease was once estalished that there was no doubt of an epidemic. The sequence of cases on the women's side was such that it seemed probable that the disease was being communicated from one person to another. Therefore all suspects were at once isolated and those having the disease were put in single rooms, with strict isolation and careful disinfection. On the suspected Ward V all untidy patients, whether having a diarrhea or not, were put to bed, and their stools inspected and disinfected. No new case developed on the women's side of the Infirmary between May first and mid-August, the beginning of the second outbreak.

On the men's wards, as on the women's, there was one ward entirely free from the disease. These were both wards on which nearly all the patients were bedridden. On the other wards of the men's side the cases occurred in such sequence that no conclusion could be drawn in regard to the mode of transmission of the disease. A nurse who slept on the women's side, but worked among the men patients, had a diarrhea at the date of the first onset among the men patients, but it could not be satisfactorily proved that she was the carrier. No new case developed on the men's side between mid-May and mid-August.

In the investigation of the source of the epidemic, attention was directed first to the food and milk supplies. The food supplies for the entire West Group are brought over daily from the main storehouse at the East Group, a quarter of a mile distant. The milk comes partly from the hospital herd, and partly from a city firm. The food for all persons in the West Group (staff, employees and patients) is prepared in the main kitchen at the Fisher Building (see Chart 1) by three cooks, assisted by six patients from that building. The nurses in each ward are assisted in serving the food by several patients living on the ward.

Identification of the organism concerned in the epidemic as a member of the paratyphoid enteritidis group at once brought the meat under suspicion, in view of the association of bacilli of that type with epidemics of meat poisoning. Cultures were made from the surface and interior of meat and poultry in the West Group refrigerator at the beginning of the epidemic, but the results were negative. Cultures from the milk of both the State Hospital and outside supply were also negative.

Investigation of the West Group kitchen employees and patients, also of the porter and his assistant (patient) who delivered food to the Infirmary, elicited no history of diarrhea and they all gave negative agglutination reactions with the epidemic organism. Cases of diarrhea among the patients of the East Group at this time yielded neither the organism nor an agglutination reaction, and at no time since has there been a case of this infection at the East Group. The limitation of the disease to the West Group suggested a contamination of the food after reaching the Group. The examination of food and food handlers was made before the two isolated early cases, described in the following paragraph, were discovered.

Finding the agglutination test positive among the nurses who had a diarrhea during the first outbreak brought up the question of possible cases previous to that time. Two such were found: a woman patient who had had a diarrhea for one day only (April 4, 1915), who was not on the ward on which dysentery first developed, and a man patient, who is not recorded as having intestinal symptoms, but who on March 20, 1915, had an indefinite illness characterized by fever and muscular weakness.

A review of death and autopsy reports furnished no clue to earlier cases. There had been no epidemic of any kind at the hospital since a paratyphoid A infection in 1910.[1]

The West Group refrigerator was out of use during the first two weeks in April, 1915, while it was undergoing repairs, and during this time the food was kept in makeshift places. The reconstruction of the refrigerator was necessitated because it failed to keep the food cold and was not mouse-proof. For a few weeks before the acute outbreak there had been quite a number of mild diarrheas among the nurses and attendants, also affecting some other persons in the Group, but not sufficiently severe to incapacitate them. No attention was paid to these attacks at the time, and only detailed inquiry later elicited a history of them.

A remotely possible complication of the situation is the fact that in the spring of 1914 hog cholera was epidemic among the pigs, and again in August, 1915. Hog cholera is thought to be due to a filterable virus, but associated with the latter are various members of the paratyphoid-enteritidis group. The most frequent of these is B. suipestifer, which was at one time thought to be the cause of the disease. The exact relationship of these organisms to the lesions is still undecided. B. suipestifer is supposedly non-pathogenic for man, but a number of human infections proved to be due to it have been reported. These were of the acute intestinal type. The occurrence of hog cholera the year previous to the human epidemic, the known association of the paratyphoid-enteritidis group with hog cholera, the finding of a member of the group as the cause of the human epidemic, and evidence which tended to show that the latter was not due to a suddenly introduced food infection, raised the question of a possible connection between the animal and the human epidemic. Cultures were made from the lymph-nodes and spleen of a hog-cholera animal killed at the hospital in August, 1915 The organism proved to be of the colon bacillus type, and by agglutination reactions did not show a close relationship to the bacillus of the human epidemic.

From a review of the first outbreak it seems probable that the immediate source of the epidemic was not a suddenly introduced food infection; that the disease was communicated from one person to another; that it was endemic, and that previous mild cases of diarrhea among patients and employees had been overlooked. There is a possibility that the cause of these diarrheas may have been contamination of the food in the refrigerator by rats and mice, as these animals frequently harbor bacteria of this group in the intestine (mice, B. suipestifer; rats, B. enteritidis).[2] It may be possible that these animals were the connecting link between the hog cholera and the human epidemic.

The second outbreak began in mid-July with mild attacks of diarrhea among the nurses at the Cowles Building. These were not mentioned until dysentery appeared among the patients of this building early in August. The Cowles contains about 125 chronically disturbed women, young or in early middle life, and nearly all strong physically. From August first to October there were 24 cases, and no ward was exempt.

In mid-August came a recurrence in the Infirmary, on both the men's and women's sides, without regard to wards. About the same number of patients had the disease as in the spring, but there was only one fatality. The last group of cases was on the women's side, one case on September 30 and nine between October 23 and 27.

In mid-August and early September there were also a number of cases of diarrhea and dysentery in the Fisher Building among patients, nurses and officers.

As to the mode of transmission of the disease in the second outbreak, there seems no doubt but that flies played a leading part, for they were very numerous in all the buildings of the West Group. The buildings are incompletely screened. As breeding-places for flies should be mentioned the stables, barns and piggery which were situated within a few hundred feet of the buildings for patients.

III. CLINICAL DESCRIPTION.

The following is a description of the disease as it appeared on the women's service of the Infirmary during the first outbreak. The disease, as a whole, presented such a definite picture that it is unnecessary to describe individual cases. The duration in recovered cases was about three weeks, in fatal cases five to ten days. The incubation period could not be definitely ascertained, but the limits were apparently twenty-four hours and seven days. The onset was characterized by prostration, headache, backache, and large watery stools containing mucus and blood.

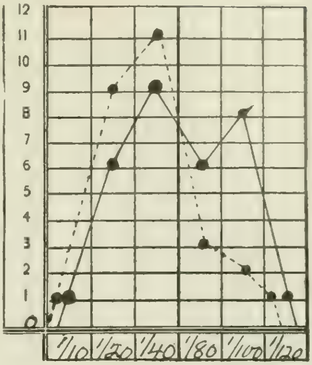

CHART 2. Agglutination reactions in third and fourth weeks after onset.

——— Dysentery cases 32
- - - - - Diarrhea cases 27

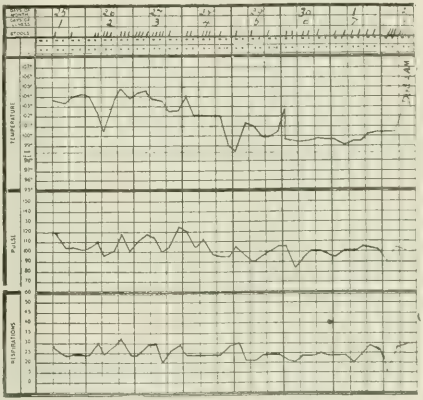

CHART 3.

The temperature curve was somewhat variable. The initial temperature was between 99° and 104°, but was usually high, remaining so from three to five days, then dropping gradually during one or two days to 99°, and remaining there for about a week before returning to normal. Occasionally there was a rise to 101° after the fall. The pulse was usually high with the temperature, 110 to 120. One fatal case, however, had an initial pulse of 100 with a temperature of 104°, with a rise in the pulse rate as the temperature fell.

A few hours after the onset the tongue became dry and covered with a white fur and the lips were dry and red. With the fall of temperature the tongue gradually became moist, but the heavy white coat persisted after the dysentery had ceased, even as long as three weeks.

There were no throat symptoms and no glandular enlargement.

The liver and spleen were not enlarged, either at the beginning or as the disease progressed.

Nervous symptoms were not prominent. The headache disappeared within twenty-four hours. Two of the fatal cases became restless, picking at the bed-clothes.

The skin showed no rose spots. The face was much flushed during the high temperature, then the face and body became sallow and the skin dry.

The appearance and number of the stools were quite characteristic, six to eight in twenty-four hours, large, watery, brown, containing blood and mucus. The odor was exceedingly foul. In one fatal case, two days before death there was a severe hemorrhage, with large clots of blood. In another fatal case there appeared large pieces of mucus, almost like casts of the intestine. In the severe cases that recovered, the dysentery persisted two to three weeks.

The abdomen was soft and usually not tender. There was some tenesmus for the first few days. In one fatal case the abdomen became distended with gas a few days before death.

There was marked muscular weakness, persisting weeks and even months after recovery from the dysentery. The muscles became very soft and the patients lost weight early.

Clinical Tests.—The urine showed a trace of albumen. The blood picture varied somewhat in different patients and in the same patient during the course of the disease. In no case did an anemia develop. The total white count was rather more variable than the differential, ranging between 5,000 and 10,000, and not decreasing with the progress of the disease. In the severe cases, uncomplicated with pneumonia, the polynuclears were between 54% and 66% during the first two weeks, the lower per cent. for the individual being in the first week. The lymphocytes persisted rather high, between 27% and 40%. Eosinophiles were not found in any case examined during the first week; in the second week they reappeared in .5%-2%. Transitionals gave a higher per cent. in the first than in the second week. The blood picture of the third week was practically the same as that of the second week both for protracted cases and convalescents. In the pneumonic-dysenteric cases, the polynuclears were relatively higher, 72%-77%, but the total count was only moderately increased, 8,000-12,000; in the recovered cases of this class, the lymphocytes showed a high per cent., 37%-43% in the third week. In all cases blood platelets were much increased.

Blood cultures taken in two cases during the first week were negative. A culture from the urine in one very serious case that recovered was negative for the epidemic bacillus, but yielded a streptococcus.

The diagnosis was made from the clinical signs, finding the organism in the stools, and by the agglutination test (see sections on bacteriology and agglutination).

Convalescence was slow because of extreme muscular weakness and recurrence of diarrhea with any but the most careful diet.

Sequelae were not observed, unless the muscular weakness may be regarded as such.

The diet and medical treatment were about the same in each case. Boiled or plain milk and barley water were best taken, and any change from this routine in early convalescence invariably brought back blood or mucus in the stools. At the beginning of the outbreak some days were spent in experimenting with ipecac and morphine and antiseptic or astringent irrigations. The drugs had no effect on the dysentery and the irrigations were irritating. The following treatment was then adopted: a daily high saline irrigation and strychnia sulph. gr. 1/60 t.i.d. by mouth. Castor oil was used at the onset and for constipation during convalescence.

Vaccine therapy was tried in two protracted cases. The doses were small, beginning with 50,000,000 and increasing 25,000,000 with each dose until four doses had been given, the injection being made every second day. It may have been a coincidence that convalescence began during this treatment.

The mild attacks among the nurses were characterized by a diarrhea lasting about twenty-four hours, with numerous offensive watery movements, accompanied in some instances by griping pains. The diagnosis was made later by agglutination tests.

The clinical description of the second outbreak in the Infirmary, from August to October, 1915, corresponds to that of the first, except that the disease was of shorter duration and less severe. The diagnosis of bronchopneumonia was made in two cases about twenty-four hours before the dysentery appeared. Among the patients in the Cowles Building the acute stage of dysentery lasted about three days. It was often ushered in with nausea and vomiting, a sharp rise in temperature and increased respiration. The patients were kept in isolation from seven to ten days and recovered with their former physical activity. The cases among the employees were short attacks of diarrhea or dysentery lasting from one to three days.

An acute arthritis of the knee joint developed in one of the less severe cases ten days after the onset and two or three days after recovery from the intestinal disturbance. The highest temperature during the arthritis was 101°. A week later the other knee became involved, the temperature again rising to 101°. The leukocyte count was 10,000 with polymorphonuclears 71%.

Differential Diagnosis.—The paratyphoid group of infections is usually divided clinically into a gastro-enteric and a typhoid form, to which it appears, from the present observations, and those accumulating during the present war, a third form, the dysenteric, should be added. Bainbridge[2] maintains the view that B. gärtneri, B. suipestifer, and B. typhi murium, associated with food and especially meat poisoning, cause the gastro-enteric type, while B. paratyphosus *A* and *B*, spread by human carriers, and never found except in connection with human disease, cause the typhoid form. Uhlenhuth and Hubener,[3] on the other hand, consider paratyphoid *A* and *B* also as a cause of acute food poisoning, and state further that the different clinical types may appear in the same epidemic. During the present European war the British have made numerous reports of paratyphoid *A* and *B* infections, describing chiefly the typhoid form, but mentioning also a dysenteric.[4]

The typical gastro-intestinal form comes on suddenly, usually from twelve to forty-eight hours after eating infected food, with headache, chilliness, pain in the abdomen, and vomiting, followed by a rise in temperature and pulse, and a diarrhea. The stools are described as exceedingly offensive, and muscular weakness, both during the acute stage and convalescence, is very marked. The acute period lasts two to five days, and the total duration of the disease is about one week.

The typhoid variety resembles a mild form of true typhoid. Sequelae are frequent, the most common, perhaps, being an arthritis. Serious local lesions, such as abscess of the lung or osteomyelitis, may follow paratyphoid *B*.

Short descriptions of the dysenteric form have appeared during the war from British and Austrian sources. Bassett-Smith[4] remarks that cases (military) coming home labelled "dysentery" should be regarded as potential paratyphoid, because many of them are found to be that. C. Miller[4] regards the dysenteric as the most severe form of paratyphoid infection seen at the Netley Hospital. The majority, and most of the severe cases, are due to paratyphoid *A*. He describes the patients as emaciated, blue and pulseless, often showing a petechial rash, subcutaneous hemorrhages, and an aphthous stomatitis and pharyngitis. There is constant flux of pink mucus in small quantities, with tenesmus. The mortality is high.

Korezyski[5] describes four cases of paratyphoid dysentery with autopsy. The disease attacked persons who were physically reduced, and toxic features were prominent. He divides the cases into two groups, the enteric, in which the lesions (hemorrhage into mucosa and occasional ulceration) are situated in the small intestine—the stools are feculent, with only traces of blood, and tenesmus is absent; and the dysenteric, in which there is an inflammation of the large intestine, and stools are numerous, small, with much blood and mucus, and there is tenesmus and pain over the descending colon.

The present disease has clinical features of both the typhoid and gastroenteric varieties, but differs from the usual picture of both. It agrees with the typhoid form in the presence of a septicemia, respiratory symptoms, and arthritis as a sequel, but, considered as a whole, does not give at all a typhoid picture. It resembles the gastroenteric form in that the symptoms, except in the most severe cases, are predominantly intestinal (although in the typical gastroenteric variety these are usually of the acute diarrheal, and not of the dysenteric type), and in the marked muscular weakness. It differs from it, however, in the absence of nervous symptoms and of the features of an acute intoxication. It is conceded, however, that the gastroenteric form may vary in its course, that it may be of long duration, with irregular fever, diarrhea and bronchitis, also that systemic infection may follow the acute stage.

The disease which the ordinary severe case resembles most clinically is, however, neither of the chief forms of paratyphoid infection, but bacillary (Shiga) dysentery. A comparison of the main features of the two diseases is therefore given:—

BACILLARY DYSENTERY (SHIGA)	EPIDEMIC DYSENTERY B. S. H.
Onset	
Acute diarrhea and colic.	Acute diarrhea or dysentery. Nausea and vomiting may be first symptoms.
General Symptoms	
1. Temp. 101°–102° F. Severe cases, 104°.	1. Temp. 99°–103° F. at onset. Slightly irregular course.
2. Headache, general malaise, and, in severe cases, muscular pains.	2. Headache, backache, aching in limbs at onset. Prostration.
Abdominal Symptoms	
1. Pain, severe colic.	1. Pain early in disease and not severe.
2. Tenesmus, marked.	2. Tenesmus early in disease and not marked.
3. Tenderness on pressure.	3. Tenderness not usual.
4. Abdomen usually somewhat excavated.	4. Abdomen usually soft and normal in appearance. Excavated in 1 fatal case. Distended in 1 fatal case.
Tongue	
Moist, somewhat coated in slight attacks. Thick, dirty brown coat in typhoid dysentery.	Moist in mild cases and dry in severe cases. Heavy white coat.

Character of Stools	
1. Diarrhea at onset not characteristic. 2. Mucus, small amt. at first. Pure mucus and blood within 2 to 3 days. 3. Quantity is small; an ounce or less, and stools are frequent.	1. Large, brown watery stools. Odor very foul. 2. Flecks of mucus and blood may appear at onset or after 1 to 2 days. Both usually absent in mild cases. 3. May continue large and watery or become small in amt. About 8 stools in 24 hours in both mild and severe cases. 4. Constipation in convalescence.
Lung Symptoms	
None.	Respiration increased in nearly all cases at onset. Bronchopneumonia and multiple abscesses of lungs in fatal cases.
Bladder Symptoms	
Tenesmus.	No bladder symptoms.
Incubation Period	
2 to 4 days.	24 hours to 7 days.
Duration and Course	
Light cases, 4 to 8 days. Severe cases, 3 to 6 weeks. Disease may become chronic.	Duration of light cases, 1 to 4 days. Duration of severe or fatal cases, 5 days to 3 weeks. Recurrences, but chronic cases not observed.
Complications and Sequelae	
Parotitis, ascites, peritonitis. Prolapse of rectum frequent.	Acute arthritis, 1 case. Vomiting, 1 case. Prolapse of rectum, 1 case. Muscular weakness, all cases.

IV. PROPHYLACTIC VACCINATION.

In December, 1915, and January, 1916, prophylactic vaccine treatment was given to 125 women patients in the Infirmary. A formalized vaccine was used, prepared from seven strains isolated in the spring and summer of 1915 from the feces of given clinical cases, also from the hearts' blood of two autopsied cases. The especially feeble or sick and those who had had the disease were excepted from treatment, and a few other patients refused to be vaccinated. Fifty-one of the stronger and more active patients were given three inoculations, one week apart, the first 500,000,000 and the remaining two 1,000,000,000. A local reaction was usual, but in only a few instances was a constitutional one observed.

Thirty-two patients received two inoculations and forty-two only one. The latter patients were among the bedridden, in whom the local reaction was, as a rule, very marked, with redness and swelling of the entire arm. A constitutional reaction, characterized by prostration, also occurred among the majority of this class. The treatment was discontinued among the very feeble patients because of the disturbing effect of the reactions.

From January, 1916, when prophylactic treatment was given, to July, 1916, there were seventeen cases of diarrhea among the women patients of the Infirmary. The cases were scattered and few in the winter, but appeared in groups on certain wards in the spring. Of these 17 patients, ten had been vaccinated (eight with three doses and one each with one and two doses); three had suffered from the disease in 1915, and four had had neither the disease nor the inoculations. All attacks, except one, were mild and short. Some of the patients had only a slight rise in temperature, but all were somewhat prostrated. The exception was a fatal case (see case 5, pathological section) of a severe dysentery, in a senile dement who had refused vaccination; but it should be stated that she had not recovered well from a recent pneumonia and was found also at autopsy to have a subdural hemorrhage. Eight of the seventeen cases were on Ward V, which was the hotbed of the disease in 1915.

In the Cowles Building, also, there occurred in May, 1916, three cases of the short dysenteric type in patients who had not previously had the disease.

Although these experiences indicated that neither prophylactic vaccination nor a severe attack gives more than transient immunity, vaccination was continued in July, 1916, all of the Cowles patients, and all additional women Infirmary patients who were strong enough for the treatment, being given three doses.* It was hoped that by vaccinating shortly before flytime, an immunity of sufficient duration might be produced to tide the patients over that season; and that even if the disease could not be entirely eliminated by prophylactic vaccination, at least its type might be reduced from the severe dysenteric to the mild diarrheal.

From July 1 to October 15 there were 6 cases of diarrhea among Infirmary patients who had been completely vaccinated, 5 among those incompletely vaccinated, 2 in patients not vaccinated, and 6 recurrences in unvaccinated patients. There was also one case of dysentery and several of diarrhea among the 125 inoculated Cowles patients.

Tabulation of the results on the women's side of the Infirmary gives the following:—

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* The inoculations were made by Mr. John C. [illegible] of the Harvard Medical School, laboratory interne for the summer of 1916.

		Cases among These.	Remarks.
Total patients completely vaccinated from Dec., 1915, to Oct., 1916.	64	13	All diarrheas.
Incompletely vaccinated	72	8	All diarrheas.
Not vaccinated	65	7	1 fatal dysentery.
Total women infirmary patients having disease in 1915.	41	Recurrences among these (not vaccinated). 9	1 dysentery (short). Rest diarrhea.

The majority of the cases occurring after vaccination and among those not vaccinated are in patients who are feeble yet not strictly bedridden. New bedridden patients do not usually acquire the disease. The recurrences are in patients who at the time of the first attack were feeble and have since become bedridden. They are, in general, much milder than the original attack, and a number were so slight and transient that they would have passed unrecognized if special study were not being given to the subject.

That the new cases and recurrences are due to the epidemic organism is evidenced by the appearance of agglutination reactions in the former and the persistence of reactions at comparatively high dilutions among the latter after attacks.

Agglutinins range usually from 1/80 to1/150 within one month after vaccination and persist at a low level (1/10) for at least 10 and 11 months (see section on agglutination).

It is evident that immunity after this disease is, at least in feeble persons, irregular and probably usually of short duration. In this respect it resembles Shiga dysentery. The duration of immunity after the various forms of paratyphoid infection is not definitely known.

It is clear, also, that as brilliant results cannot be obtained from prophylactic vaccination in this disease as in the case of either typhoid or probably the typhoid form of paratyphoid. The difficulties are two: the first inherent in the transient character of the immunity; the second due to the fact that the disease is particularly prone to attack debilitated persons, who as a rule do not stand prophylactic vaccination well. Nevertheless, the writers are convinced that without it cases of the disease would have been more numerous, and, particularly, more severe during the present year, and that it should be continued upon all suitable exposed patients as another way of combating the disease among a class of patients with whom it is difficult to carry out rigorous hygienic measures because of untidiness and lack of co-operation. It is notable that cases after prophylactic vaccination were decidedly fewer at the Cowles Building than at the Infirmary, this being due, doubtless, to the stronger physical condition of the former patients. The differences found in the leucocytic reactions of strong and weak patients after doses of vaccine (see section on leucocytic reaction) give a further suggestion on this point. It seems probable that prophylactic vaccination among a fairly strong class of individuals is of considerable value, and that results might be much better among the general population or in armies than in insane hospitals.

The writers have been unable to ascertain that until the present war prophylactic inoculation against members of the paratyphoid-enteritidis group has been tried on a large scale, or that it has ever been undertaken under institutional conditions. Vaccination against paratyphoid *A* and *B* is now, of course, being practised extensively in the European and United States armies, in conjunction with antityphoid inoculation, but data on its efficiency will not be available for some time.

Several experiments in vaccination on a large scale against bacillary dysentery have been made, both in European insane hospitals and among the general population. In the former, the results, although not given in detail, are said to have been successful in stopping an epidemic. Shiga[6] in 1898 to 1900 inoculated about 10,000 persons in a district of Japan where epidemic dysentery prevailed most seriously, and diminished the mortality from 20-30% to about zero.

V. SKIN REACTIONS.

Tests for specific skin reactions were tried with a few patients, of whom 12 had had the disease one to twelve months previously; ten had received prophylactic treatment one to nine months previously; and seven had had neither the disease nor prophylactic treatment. Tests with paratyphoid *A*, B. suipestifer and B. enteritidis were also made with these same patients. The method was the same as that described by Gay and Force[7] in 1914 for the typhoidin skin reaction, concentrated five per cent. glycerine broth cultures being used, with a similarly concentrated glycerine broth solution as a control. The intradermal was preferred to the scratch method as the reaction with the latter was too delicate and transient and often difficult to distinguish from trauma. Different dilutions of the glycerine broth culture were made with normal salt solution (lowest 1-2, highest 1-12) with a desire to find what strength would cause a perfectly distinct reaction in the immune and a negative one in the non-immune individual. By the intradermal method a bleb was formed by the injection of .1 cc. of the dilution, a short needle of a given caliber being used in all cases.

The reaction from the control dilutions was a slight redness of a few mm. at the point of injection, disappearing in less than 24 hours. The reaction from the culture dilutions was an erythema of a diameter varying with the strength of the dilution, and having, in some cases, a darker red indurated center. The reading was made at the end of 24 hours. The indurated area sometimes persisted for a week.

The following observations were made:—

1. The control patients showed reactions that were often difficult or impossible to distinguish from the reaction in those who had the disease.
2. The reaction varied somewhat in intensity in different individuals, but this did not correspond to the time lapsing between the attack or prophylactic treatment and the test, nor was it more marked in those who had had the disease.
3. In nine cases in which agglutination reactions were made within a few days or three weeks after the skin test, comparisons were made. One patient who had the disease 10 months before showed severe local reaction from a low dilution (1-2) of the different cultures and a constitutional reaction, with fainting and nausea; three weeks later the agglutination reaction was entirely negative. There were equally marked skin reactions in two patients having agglutination reactions of 1-10 and 1-150 three weeks later.
4. High dilutions caused a doubtful or negative reaction, in certain patients who had had the disease, although causing a distinct reaction in some control cases.
5. Skin tests made with similar broth cultures of other members of the paratyphoid group showed reactions varying slightly in intensity in the different individuals.
6. The concentrated glycerine broth cultures, made up at different times, varied in their results, and apparently deteriorated in a short time, so that any standardization of dilutions was not possible.

These observations would indicate that the intradermal skin reaction with the concentrated glycerine broth cultures has not been of any clinical value in testing the duration of immunity in these cases, or in distinguishing this disease from infections by other members of the paratyphoid group.

Those who have studied the typhoidin skin reaction vary in their conclusions regarding it. Gay[8] considers it of value in indicating the duration of immunity in those having received prophylactic treatment, that re-vaccination is indicated when the skin reaction is negative. Kolmer and Berge[9] in their study of the typhoidin skin reaction observed that a reaction could be obtained over a longer period in those who had had the disease than in those having had prophylactic treatment only. They found agglutinins and complement-fixing antibodies usually present in those reacting to the skin test. Kolmer and Berge used a powdered typhoidin and control furnished by Gay but, because of the severe reaction caused by the control, they regarded the reading of the tests as subject to error.

An effort will be made to test these patients with powdered cultures of the same members of the paratyphoid group, before setting aside the skin reaction as of no clinical value in this disease.

(To be continued.)

A YEAR'S WORK WITH THE WASSERMANN TEST, IN THE BOSTON HEALTH DEPARTMENT LABORATORY, WITH ESPECIAL REFERENCE TO DOUBTFUL REACTIONS.

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SINCE the publication of Bordet and Gengou, 1901, describing the phenomenon of complement fixation, many observers have endeavored to apply this test for the diagnosis of the various infectious diseases. Among such investigators were Wassermann and Bruck, who in 1905 were endeavoring to establish a test for tuberculosis by this important reaction.

About this time Hoffman and Schaudinn demonstrated the causative organism of syphilis, the Spirocheta Pallida. This discovery stimulated many workers to further effort, and we find the first publication, in May, 1906, by Wassermann and Bruck, describing the phenomenon of complement fixation in the diagnosis of syphilis.

Their work led many research workers to investigate this test, and practically all confirmed their findings.

In 1907 Weygandt reported fairly reliable results, using a watery extract of normal human spleen as an antigen.

About the same time Marie and Levaditi reported similar results, using an aqueous extract of normal fetal liver.

In December, 1907, Landsteiner, Muller and Potzl reported very favorable results, using an alcoholic extract of guinea pig heart as an antigen.

Up to 1911 all work in this test was in the experimental stage. Since then various boards of health, especially those of the larger cities, have added this test to the regular routine work which is carried out in municipal laboratories for physicians.

The Boston Health Department also considered the establishing of this test, but on account of certain obstacles the work was postponed from year to year. In the latter part of 1915, it was, however, decided to start the work, beginning with the year 1916.

Various modifications of the original Wassermann test, as devised by different workers, namely, the so-called New York or ice-box method, the methods used by the various hospital laboratories in this city, as well as in nearby city hospital laboratories, were tried out and a definite form was established, to which we have adhered with the exception of such modifications as described below.

Since January 1, 1916, free Wassermann tests have been offered by the Boston Health Department Laboratory as an additional routine examination, and during the year over 2500 of these tests were made, showing that this opportunity was thoroughly appreciated.

Specimens may be submitted by physicians in outfits provided by the laboratory, or the patients may be sent to the laboratory to have the specimens taken. The laboratory is prepared to receive these patients and to collect the specimens of blood from 2 to 4 p.m., only, on certain days of the week.

History blanks are mailed to physicians on request, and each patient appearing at the laboratory must present one of these, carefully filled out and signed by his attending physician. Specimens are not collected at any other time, nor are they collected from patients coming without carefully prepared history cards.

Reports upon the examinations are made to the physicians only.

Physicians who wish to collect the specimens themselves may obtain outfits at the laboratory, but are responsible for their careful return after the specimens have been taken.

Reports. The reaction as carried out in this laboratory has the following diagnostic significance: *Positive* indicates syphilis, except very rarely in acute febrile conditions, such as malaria and pneumonia. *Negative* does not exclude syphilis. In dealing with obscure conditions less than three negatives cannot be relied upon. *Doubtful* signifies an inconclusive result. It is advisable to submit several specimens in such a case, and to interpret a persistently or predominatingly doubtful reaction as indicative of a syphilitic infection. *Unsatisfactory* means that the test was unsuccessful either because of the condition of the specimen or on account of some difficulty with the technic. In the latter event the test is repeated on the next testing day, otherwise a new specimen is requested.

In addition to the above reports, as will be explained later, the laboratory has been sending out a few reports of "moderate positive," indicating an undoubted positive but of a less degree of intensity.

TECHNIC USED IN THE TEST.

Preparation and titration of reagents.

Antigens. Two antigens have been used, the first an alcoholic extract of human heart, cholesterinized, and the second an acetone insoluble antigen prepared from fresh beef heart by Noguchi's method.

The cholesterinized antigen is prepared according to the method of Swift and Ellis, as follows:

Put some fresh human heart, free from fat or fibrous tissue, through a meat grinder, and to 50 grams of this ground material in an Erlenmeyer flask add 500 c.c. of absolute alcohol and shake well. Cork and place in an incubator at 37° C. for two weeks, giving it a thorough shaking each day. At the end of two weeks' incubation the solution is filtered, the filtrate placed in the ice chest over night and again filtered. The filtrate is then kept closely stoppered in the ice chest and, as needed, is removed in quantities of 100 c.c. To this amount (100 c.c.) of the filtrate is added .4 gm. of Kahlbaum's cholesterin. This is shaken and then incubated at 37° C. for 24 hours, to dissolve the cholesterin. The antigen is now ready for titration and use. The cholesterinized antigen should be kept at room temperature as the cholesterin precipitates if kept in the cold. As needed for use it is diluted 1 part to 9 with normal salt solution, adding the salt solution slowly and with constant shaking. It is then titrated for exact strength, as described later.

The acetone insoluble antigen is prepared as follows:

Fifty grams of ground fresh beef heart free from fat or fibrous tissue are mixed in an Erlenmeyer flask with 500 c.c. of absolute alcohol, corked and put into an incubator at 37° C. for two weeks, shaking the mixture well each day. At the end of two weeks the preparation is filtered and the filtrate evaporated by the use of an electric fan. The residue is dissolved in about 25 c.c. of ether and allowed to stand in a cool place over night, covering the dish to prevent evaporation. The supernatant portion is then decanted into another receptacle and evaporated to a small volume (5 to 10 c.c.). This is then mixed with ten volumes of pure acetone. The precipitate which forms is allowed to settle and the supernatant liquid decanted.

The acetone insoluble portion is the antigen.

Each .3 gm. of this substance is dissolved in 1 c.c. of ether and 9 c.c. of pure methyl alcohol added. This stock solution is kept in the ice chest, and as needed for use is diluted 1 part to 14 with normal salt solution, adding the salt solution slowly with constant shaking. It is then titrated for exact strength as described later.

Amboceptor. Rabbits are injected with washed red corpuscles of the sheep made up to the original blood-volume with salt solution. Gradually increasing doses are injected intraperitoneally at about 3 to 4 days intervals, using injections of 7 c.c., 14 c.c., 21 c.c. and 28 c.c., Seven days after the last injection about 1 c.c. of blood is withdrawn from the ear vein and the serum titrated. If the serum shows a high titre 40 to 50 c.c. of blood may be withdrawn from the rabbit's heart with an ordinary antitoxin syringe. In the hands of an experienced operator the rabbit suffers no ill effects from this operation and may be used again for amboceptor after a lapse of one or more months with but one or two additional injections of sheep's cells, as described above. The blood is allowed to stand for a few hours at room temperature for the formation of a good clot. It is then placed in the ice chest over night and on the following day the serum is separated. Precautions for asepsis should be observed throughout this whole procedure. The serum is placed in 1 c.c. glass ampules, sealed and inactivated in a water bath at 55° C. for 30 minutes on three successive days, after which it is kept in the ice chest and withdrawn as needed.

Complement. The complement used is fresh blood serum from guinea pigs. By withdrawing the blood from the heart, and allowing three or four weeks for recuperation, the pigs may be used over and over again. A fair sized pig should furnish about 8 c.c. of blood without being seriously injured. Before operating primary anesthesia is induced with the A. C. E. mixture.

The serum separates out better in petri dishes than in test tubes. The blood is preferably drawn on the afternoon before the serum is needed for the tests, allowed to stand an hour or so at room temperature and then placed in the ice chest over night. In the morning the serum is separated, diluted to 10% with normal salt solution and titrated.

The patient's blood is collected with aseptic precautions, from one of the veins in the bend of the elbow, preferably the median cephalic. It is well to draw from 5 c.c. to 10 c.c. in a sterile tube, after which the tube is slanted. A good separation of serum will be obtained if, after clotting, the clot is broken away from the sides of the tube. After standing an hour or two at room temperature, the blood is placed in the ice chest over night. In the morning the serum is withdrawn and centrifuged if cloudy. It is then inactivated by placing it in a water bath at 55° C. for 30 minutes.

Sheep's cells are obtained by washing fresh drawn, defibrinated, sheep's blood three times with normal salt solution by means of the centrifuge and diluting the final concentration of cells to 5% with salt solution. It is convenient to draw the sheep's blood and wash the corpuscles the night before they are to be used, keeping them in the ice box and diluting just prior to use.

Salt Solution is prepared by dissolving 8.5 grams of c.p. sodium chloride in a litre of distilled water and sterilizing in an Arnold sterilizer for at least one hour.

Pipettes. The following pipettes are used:

10.0 c.c. pipettes graduated into .10 c.c.
5.0 c.c. pipettes graduated into .10 c.c.
1.0 c.c. pipettes graduated into .10 c.c.
.3 c.c. pipettes graduated into .01 c.c.

Directly after use each pipette is placed in normal salt solution.

After the tests are finished all the pipettes are rinsed with clean water and dried in the hot air oven.

Titration of the Amboceptor. To .1 c.c. of the undiluted amboceptor is added 9.9 c.c. of normal salt solution and the mixture is thoroughly shaken. This gives a dilution of 1-100.

To .1 c.c. of the 1-100 dilution is added .4 c.c. of normal salt solution, giving a dilution of 1-500.

To .1 c.c. of the 1-100 dilution is added .9 c.c. of normal salt solution, giving a dilution of 1-1000.

To .1 c.c. of the 1-100 dilution is added 1.4 c.c. of normal salt solution giving a dilution of 1-1500, and so on until dilutions up to 1-5000 are prepared.

Now a series of tubes is taken and in each one, marked with the dilution factor, is placed .5 c.c. of the correspondingly diluted amboceptor. To each tube is added .5 c.c. of 10% complement or if the complement has been titred and its unit found, twice the unit may be used.

To each tube is added .5 c.c. of 5% sheep's corpuscles and a sufficient amount of the salt solution to bring the volume up to 2 c.c.

The contents of the tubes are thoroughly shaken and placed in a water bath for one hour at 37° C., at the end of which time the results are noted.

That amount of amboceptor that just completely hemolyzes the corpuscles is taken as the amboceptor unit.

Two units of amboceptor are used in the Wassermann test. It is convenient so to dilute the amboceptor that .5 c.c. of the dilution contains 2 units.

TITRATION OF THE ANTIGEN.

Hemolytic Titration. Increasing amounts of the diluted antigen are placed in a series of test tubes as follows: .03, .05, .08, .1, .15, .2, .25, .3 c.c. and salt solution is added to make up each tube to 1.5 c.c., after which .5 c.c. of sheep's cells is added to each tube, the tubes are thoroughly shaken and incubated in a water bath at 37° C. for one hour and readings made. As a rule the hemolytic titration is not absolutely necessary.

In calculating the dose of antigen to be used in the test, one fourth the amount not hemolytic is generally used.

Anticomplementary Titration. Antigen is used in the same amounts as in the hemolytic titration.

Complement is added .5 c.c. of the 10% solution to each tube.

Salt solution is now added to each tube to bring the contents up to 1 c.c.

The contents of the tubes are thoroughly shaken and they are incubated in the water bath at 37° C. for 40 minutes.

The amount of amboceptor necessary for the series, using two units to the tube, and also the amount of sheep's cell needed are now calculated.

For instance, the usual dose of the diluted sheep's cells is .5 c.c. and if the amboceptor is so diluted that .5 c.c. contains 2 units it would require 4 c.c. of each for the series of tests. It is advisable to make up a little more than the actual amount needed, therefore, 5 c.c. of diluted amboceptor and 5 c.c. of diluted cells are mixed in a test tube or bottle and placed in the water-bath at 37° C. for 30 minutes, to sensitize the cells. At the end of this time 1 c.c. of the sensitized cells mixture is added to each tube in the series, the tubes are shaken and replaced in the bath at 37° C. for one hour, when readings are made.

The amount of antigen that shows beginning inhibition of hemolysis is the anticomplementary unit.

In conducting the test about one fourth of this amount is generally used.

Antigenic titration. .1 c.c. of positive syphilitic blood serum is placed in each tube and antigen and complement are added as in the anticomplementary titration. The contents are now well mixed and incubated in the water-bath for 40 minutes. Amboceptor and sheep's cells are mixed for sensitization and added as in the anticomplementary titration, the tubes are then incubated for one hour at 37° C. in the bath and the results read.

That amount of antigen that shows just complete inhibition of hemolysis is taken as the antigenic unit.

In conducting the Wassermann test two to four times this unit should be used, providing that these amounts are not more than one-fourth or one-fifth the anticomplementary dose.

THE WASSERMANN REACTION.

The sera to be tested are separated from the clots and inactivated by placing in a water bath for one-half hour at 55° C. While the sera are being inactivated the complement is separated and diluted to 10% with normal salt solution.

The daily titration of complement and amboceptor is now made as follows:

To 4 c.c. of 10% complement are added 4 c.c. of normal salt solution, thus making the 5% dilution required in the titration.

Nine tubes are arranged in a rack and in each are put the reagents as indicated in the following table:

Tubes No.	1	2	3	4	5	6	7	8	9
5% Comp.	.5 c.c.	.4 c.c.	.3 c.c.	.2 c.c.	.15 c.c.	1 c.c.	1 c.c.	1 c.c.	1 c.c.
Amboceptor of which .5 c.c. is probably 2 units	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.4 c.c.	.3 c.c.	.2 c.c.	.1 c.c.
5% Cells.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.	.5 c.c.
Salt solution	Enough to each tube to make the total volume 2 c.c.								

The contents are thoroughly shaken and the tubes placed in the water bath at 37° C. for thirty minutes.

The first five tubes show the complement titre and the last four the amboceptor titre.

If the proper dilution of amboceptor is used, tubes No. 6 and No. 7 should show complete hemolysis, while tube 8 should show partial and tube 9 complete inhibition.

Of the first five tubes the last one in which there is complete hemolysis shows the complement unit, and since two units of complement are used in the test, it will require a volume of the 10% complement equal to that of the 5% which gave the reaction in the titration; thus if there is complete hemolysis through tube No. 3, in which there are used .3 c.c. of the 5% complement, we proceed with the test, using .3 c.c. of the 10% complement for each tube.

The test proper is carried out as follows:

The test tubes are conveniently arranged in the racks in rows three deep, each set of three tubes representing one test and in each is placed .1 c.c. of the inactivated serum.

To the tubes in the first row are added the cholesterinized antigen conveniently diluted so that the right quantity is added by using .1 c.c.; the tubes in the second row receive similar doses of the acetone insoluble antigen, while those in the third row, which are used as serum controls, receive no antigen.

With each set of tests should be run a known positive blood serum, also a control tube for each antigen, these latter receiving no blood serum, but each receiving a double amount of its respective antigen.

To each tube is then added two units of complement and sufficient salt solution to make up the volume to 1 c.c.

The contents are thoroughly shaken and the tubes are placed in the water-bath at 37° C. for 40 minutes.

The amounts of amboceptor and cells needed for the series are now calculated.

If the amboceptor is so diluted that .5 c.c. is equal to two units, the calculation is easily made; if, for instance, there are 90 tubes, it will require 45 c.c. each of diluted amboceptor and 5% cells. It is usually well to make up a little more than the actual amount required to be sure of enough material.

The amboceptor and cells are thoroughly mixed and are incubated in the water-bath at 37° C. for 30 minutes. After these incubation periods are ended 1 c.c. of the sensitized cells mixture is added to each tube and mixed thoroughly by shaking the tubes; they are then incubated again for one hour at 37° C. and the results read.

It has been noticed that the cholesterinized antigen is a little too sensitive to be absolutely relied upon. It catches all the positives and also holds up with a few sera which show negative results with the use of other antigens.

With the acetone insoluble antigen a positive result at the end of the hour is to be relied upon, but the test may be negative when it should be positive, because the antigen is not sufficiently delicate.

During the first six months of our work we reported *positive* only on those cases where with both antigens there was no hemolysis; *negative* where both showed hemolysis and *doubtful* where the cholesterin antigen showed no hemolysis while there was hemolysis with the acetone insoluble antigen.

During the first six months' work 934 examinations were made and reports were given as shown in the following table:

	Pos.	Neg.	Doubtful	Unsat.	Total
January	9	33	4	0	46
February	27	67	9	3	106
March	37	117	15	2	171
April	36	126	14	1	177
May	50	162	13	3	228
June	47	145	12	2	206
Totals	206	650	67	11	934
	22+%	70—%	7+%	1+%	100%

Of the 11 unsatisfactory tests four were hemolyzed, four anticomplementary, two had insufficient material and one was a broken tube.

On 67 tests, or a little over 7%, "doubtful" reports were sent. The great majority of these cases gave a moderately positive reaction with the cholesterinized antigen, while the test with the acetone insoluble antigen showed a weak hold-up or was negative. The actual readings were as follows:

w = weak
m = moderate

Cholesterin	+	Acetone Insoluble	+	9	Cases
"	+	" "	—	10	"
"	+	" "	$\overset{w}{+}$	34	"
"	$\overset{m}{+}$	" "	—	6	"
"	$\overset{w}{+}$	" "	$\overset{m}{+}$	4	"
"	$\overset{w}{+}$	" "	$\overset{w}{+}$	2	"
Information not recorded				2	"
Total				67	Cases

It is a matter of regret, when one considers the difficulty often experienced in obtaining these specimens, that such a high percentage of doubtful reports should be given. We do not know the experience of other laboratories, but we are inclined to believe our experience is not exceptional, and that any practical means whereby these "doubtful" returns may be reduced in number would be much appreciated.

We therefore began on July 1st to do further work with this class of specimens by repeating the test in such cases, using .4 c.c. of the patients' serum with the acetone insoluble antigen instead of .1 c.c. in order to increase the antibody content and also running a control with .4 c.c. of the serum, feeling that it was perfectly safe to report as moderately positive any case giving a strongly positive reaction with a negative control. If the reaction was negative or very weak with .4 c.c. serum and the acetone insoluble antigen, it was still reported doubtful.

The results are shown in the figures for the next six months.

	Pos.	Neg.	Doubt.	Mod. Pos. Formerly	Neg. Doubt.	Unsat.	Totals
July	41	159	13	12	0	4	229
Aug.	48	187	13	15	0	3	266
Sept.	57	133	6	19	0	1	216
Oct.	76	167	6	10	6	4	269
Nov.	61	193	8	10	2	0	274
Dec.	87	226	12	17	0	1	343
Totals	370	1065	58	83	8	13*	1597
	23+%	66+%	3+%	5+%	1%	1—%	

Under our former method of reporting, 149, or a little over 9% of the total specimens, would have been reported "doubtful." The new method enabled us to report 91 of these either moderately positive or negative, and diminished our "doubtful" returns to 58, or a little over 3% of the total.

In the majority of the 149 cases, as originally tested with .1 c.c. of patients' serum, the cholesterin antigen was positive and the acetone insoluble negative or with but a slight reaction.

Results with 4 c.c. serum and acetone insoluble antigen were as follows:

	July	August	September	October	November	December	Totals	Report
.4+	10	15	17	5	4	13	64	Mod. Pos.
$.4\overset{m}{+}$	2	0	2	5	6	4	19	Mod. Pos.
$.4\overset{w}{+}$	3	1	3	2	0	1	10	Doubtful
.4—	10	12	3	4	8	11	48	Doubtful
Totals	25	28	25	16	18	29	141	

In eight other cases there was but a weak hold-up with the cholesterin antigen and none with the acetone insoluble even when .4 c.c. serum was used. These were reported negative.

Beginning with the last of November, partly with these tests and partly with tests of the present year, we have made a further study of these doubtful cases by comparing the .4 c.c. method and the ice-box method, using the following technic for the ice-box tests.

Tubes, one for each test, were arranged in a rack, the blood serum to be tested, acetone insoluble antigen, and complement, in volumes as described above, were placed in the tubes, the contents well shaken, and the rack placed in the ice compartment of the ice chest for four hours. At the end of that time one c.c. of sensitized cells, prepared as described above, was added to each tube and the rack placed in the water bath kept at 37° C. and readings made at the end of one hour. With the above set was also run an antigen control tube which contained twice the volume of antigen used in the tests, but no blood serum. Some laboratories recommend that the readings recorded should be made just as soon as there is complete hemolysis in the antigen control tube, but we have found that such readings often lead to false positive results.

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* Of the 13 unsatisfactory specimens, 7 were haemolysed, 2 anti complementary and 4 insufficient in quantity to carry out the 4 c.c. test.

A series of 50 of these cases, with unsatisfactory reactions in the regular routine, has been made, with the following results:

	37° C.			Ice Box			37° C.			Ice Box	
No.	.1 Chlor.	.1 Acet. Insol.	.4 Acet. Insol.	.1 Acet. Insol.	Report	No.	.1 Chlor.	.1 Acet. Insol.	.4 Acet. Insol.	.1 Acet. Insol.	Report
2107	+	—	$\overset{m}{+}$	+	Pos. m	1	+	—	+	$\overset{m}{+}$	Pos. m
2126	+	—	+	—	Pos. m	28	+	—	$\overset{m}{+}$	+	Pos. m
2177	+	—	$\overset{m}{+}$	$\overset{m}{+}$	Pos. m	30	$\overset{m}{+}$	—	$\overset{m}{+}$	—	Pos. m
2204	+	—	$\overset{m}{+}$	+	Pos. m	41	$\overset{w}{+}$	—	$\overset{vw}{+}$	—	Neg.
2205	+	—	+	+	Pos. m	79	+	—	+	+	Pos. m
2215	+	$\overset{w}{+}$	$\overset{m}{+}$	+	Pos. m	147	$\overset{m}{+}$	—	—	+	Neg.
2217	+	—	—	+	Doubt.	51	$\overset{m}{+}$	—	$\overset{m}{+}$	+	Pos. m
2239	+	—	—	$\overset{m}{+}$	Doubt.	187	$\overset{w}{+}$	—	+	+	Pos. m
2246	+	—	+	—	Pos. m	203	+	—	$\overset{m}{+}$	+	Pos. m
2271	+	$\overset{w}{+}$	$\overset{m}{+}$	+	Pos. m	214	+	$\overset{w}{+}$	+	+	Pos. m
2278	$\overset{m}{+}$	—	$\overset{m}{+}$	$\overset{m}{+}$	Pos. m	335	$\overset{m}{+}$	—	+	$\overset{m}{+}$	Pos. m
2294	$\overset{w}{+}$	—	$\overset{w}{+}$	+	Neg.	427	$\overset{vw}{+}$	—	+	+	Pos. m
2297	+	—	+	—	Pos. m	429	$\overset{w}{+}$	—	+	+	Pos. m
2339	+	—	$\overset{m}{+}$	+	Pos. m	497	$\overset{m}{+}$	—	+	$\overset{m}{+}$	Pos. m
2343	+	—	+	—	Pos. m	536	+	$\overset{w}{+}$	+	+	Pos. m
2351	+	—	+	+	Pos. m	545	+	—	+	+	Pos. m
2392	+	—	+	+	Pos. m	580	+	—	+	$\overset{m}{+}$	Pos. m
2399	$\overset{w}{+}$	$\overset{w}{+}$	+	+	Pos. m	587	+	—	$\overset{m}{+}$	—	Pos. m
2401	$\overset{w}{+}$	$\overset{w}{+}$	+	$\overset{m}{+}$	Pos. m	806	$\overset{m}{+}$	$\overset{w}{+}$	+	+	Pos. m
2403	$\overset{w}{+}$	$\overset{w}{+}$	+	+	Pos. m	626	$\overset{m}{+}$	—	—	+	Doubt.
2410	$\overset{w}{+}$	$\overset{vw}{+}$	+	$\overset{m}{+}$	Pos. m	646	+	$\overset{w}{+}$	+	+	Pos. m
2417	$\overset{m}{+}$	—	+	—	Pos. m	652	+	—	+	+	Pos. m
2423	+	—	+	+	Pos. m	680	+	—	$\overset{m}{+}$	$\overset{m}{+}$	Pos. m
2433	+	$\overset{w}{+}$	+	$\overset{m}{+}$	Pos. m	773	+	$\overset{w}{+}$	$\overset{m}{+}$	$\overset{m}{+}$	Pos. m
2438	$\overset{w}{+}$	—	—	$\overset{vw}{+}$	Neg.	776	+	$\overset{w}{+}$	$\overset{m}{+}$	$\overset{w}{+}$	Pos. m

Under our original plan of reports these 50 cases would all have been reported "doubtful."

Reports were made, however, on the outcome of the .4 c.c. tests, the ice-box method being run simply for experimental purposes. Forty-three were reported moderately positive, 4 negative, and but 3 doubtful.

Results of the two methods agree in 20 instances, in 16 tests the .4 c.c. and in 14 instances the ice-box method shows a stronger reaction.

If reports had been made with the results of the ice-box method rather than those of the .4 c.c. method, there would have been 40 moderate positives, 8 negatives and but 2 doubtful. In 37 instances the same report would have been given by either method, 36 moderately positive and one negative.

The comparison is very close, and it is difficult to say which is the more accurate. The .4 c.c. method has one advantage in that the test is much more quickly completed.

The three tests reported "doubtful" with the .4 c.c. method would have been reported positive" by the ice-box method. Seven reports of "moderately positive" with the .4 c.c. method were "negative" with the ice box.

It seems as though a consideration of these cases where results differ might give valuable information as to the comparative value of the tests. Unfortunately the histories furnished by physicians are rather inadequate upon which to base conclusions.

Case No.	Results with .4 c. c.	Results with Ice Box	Physician's Diagnosis	Treatment
2217	Doubtful	Positive	Syphilis	Neosalvarsan, 3 doses
2239	" (12 5, '16)	Mod. Pos.	Syphilis ?	None
626	" (2 6, '17)	Positive	Syphilis (2)	Salvarsan, 3 doses Mercury pills, 9 mos.
2294	Negative	Positive	" (3)	None at present For release
147	"	Positive	Not given	Not given
2126	Mod. Pos.	Negative	Not given	4 doses salvarsan 6 mos., mercury pills
2246	" "	"	Syphilis (3)	None
2297	" " (12 11, '16)	"	" (1)	Local
2343	" " (12 13, '16)	"	"	6 doses salvarsan Mercury pills, 3 yrs.
2417	" "	"	" (3)	3-4 doses salvarsan
30	" "	"	Not given	Not given
587	" " (2 1, '17)	"	Syphilis	4 doses neosalvarsan
2438	Negative	Doubtful	Not given	Not given

OTHER TESTS.

No.	Date	Result
2239	12 14, '16	Mod. Pos.
626	1 16, '17	Positive
2297	1 24, '17	Doubtful
2343	4 17, '16	Mod. Pos.
587	11 2, '16	Positive

Numbers 2239 and 626 were positive on other tests as were also numbers 2343 and 587, while a second test on 2297, after intensive treatment, was doubtful. We thus have evidence from other tests that two of the three "doubtfuls" with the .4 c.c. method were positive and also that two of those negative with the ice-box method were positive.

There is no further evidence for the two negative with .4 c.c. and positive with the ice box.

On the whole, we are inclined to regard the .4 c.c. results as equally reliable if not slightly superior in delicacy of reaction to the results obtained by the ice-box method.

We have, therefore, adopted it as routine for all cases where there is a reaction with the cholesterin antigen without corresponding effect with .1 acetone insoluble and have adopted the following table for a working basis.

Chol. Antigen	Acetone Insol. Antigen	Report
.1 pos.	.1 pos.	Positive
.1 pos.	.1 pos. mod.	Positive
.1 pos.	.1 pos. weak or neg.	To be run over with .4 c.c. serum
.1 pos.	.4 pos. or pos. mod.	Pos. mod.
.1 pos.	.4 pos. weak or neg.	Doubtful
.1 pos. mod.	.1 pos.	Positive
.1 pos. mod.	.1 pos. mod.	Pos. mod.
.1 pos. mod.	.1 pos. weak or neg.	Doubtful
.1 pos. mod.	.4 pos. or pos. mod.	Pos. mod.
.1 pos. weak	.1 pos.	Doubtful
.1 pos. weak	.1 pos. mod.	Doubtful
.1 pos. weak	.1 pos. or neg.	Doubtful
.1 pos. weak	.4 pos. or mod. pos.	Doubtful
.1 pos. weak	.4 pos. weak or neg.	Doubtful

We acknowledge the valuable assistance rendered by Mr. Aloy Soong, an assistant in the laboratory of the Boston Board of Health.

Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

The forty-sixth meeting was held at the Boston Medical Library, January 26, 1917, at 8.15 p.m; the President, Dr. Maynard Ladd of Boston, in the chair. The following papers were read:

1. President's Address, Health Insurance in Relation to Pediatrics, Maynard Ladd, M.D., Boston.
2. Congenital Malformations of the Lower Bowel, James S. Stone, M.D., Boston.
3. Congenital Heart Disease, Charles H. Dunn, M.D., Boston.
4. Are Carious Teeth an Etiological Factor in Heart Disease? E. W. Barron, M.D., Malden.

PRESIDENT'S ADDRESS.

Members of the New England Pediatric Society, Ladies and Gentlemen:

First of all, I wish to express my appreciation of the honor you have conferred upon me in electing me your presiding officer for the coming year. I hope that, with your hearty coöperation and support, the New England Pediatric Society may continue successfully to further the interests of pediatrics in this community.

There is at present, as you all know, a widespread and powerful movement to force, upon this and about twenty other states, medical insurance for workers earning less than $1200 a year. As this proposed legislation seems likely to apply eventually not only to the wage-earner, but to his family as well, it is fitting that we should study carefully the relation which such insurance may have upon the practice of pediatrics, and the position which we, as pediatrists and as representatives of the staffs of hospitals for children, should take in reference to the proposed legislation.

The movement has acquired such momentum, and the arguments in favor of it, from the point of view of the wage-earners, are on the surface so plausible, that it seems more than likely that in this state at least, some sort of a bill will be passed eventually. Once upon the statutes, it will be difficult to make amendments to the law, and its major provisions, at least, will be foisted upon the community and the medical profession whether we like them or not.

No one, so far as I can see, has as yet claimed to have a vision of the future so prophetic as to give anything like a definite conception of the changes which will inevitably result in the practice of medicine. It is safe to say, however, that the present bill, if passed, will cause a tremendous upheaval in the relations of physicians to the public. It seems likely that public sentiment will support the idea. The public will not champion the cause of the medical profession against its own interests. On the other hand, physicians, as a whole, are likely to acquiesce and even further the movement if they are convinced it is in the interests of public health.

Arguments for and against the bill, to carry weight, must be based upon its effects upon the insured. Individual interests of physicians will be sacrificed if for the good of the people. This situation we may as well accept. It is, however, our right and duty to bring before the public our experience in handling the complicated problems connected with the public health, and to forecast, so far as possible, the extent to which the radical and socialistic measures provided in the act will benefit or injure the public. We have a right to influence the provisions of the bill in its formative stage, so that, if enacted, it may prove advantageous to both the public and the medical profession. The desire to enact such legislation is so keen on the part of those favoring it, that a strong presentation of the rights of the medical profession at this stage is likely to be heeded.

In the last four years the Social Service Department of the Boston Dispensary has investigated the economic condition of more than 75,000 persons applying for treatment. If the income of the working children is excluded, only 3.5 per cent. of the wage-earners had an income of over $1000. In other hospitals there is probably a larger percentage of relatively well-to-do people treated, but no one would question the fact that for practical purposes nearly the whole clientele of the Boston hospitals for children would, by the passage of this insurance bill, become subject to the provisions of the act if families of the insured are to be included.

If the need has existed in the past, by which this immense population has been forced into hospital clinics to obtain the best of medical care in special lines, that same need will exist in the future, medical insurance or not. These patients come to specialists, partly because they cannot afford to employ us in a private capacity, and partly because the special skill and facilities for diagnosis and treatment cannot be obtained from the type of general practitioners who, undoubtedly, would be registered on the panel of physicians entitled to practice under the insurance act. It is difficult to foresee how the hospital staff as a whole could, with their arduous duties as teachers in medical schools and visiting physicians in house and out-patient clinics, find time to care for the insured class as panel physicians. If, then, the children of the insured continue to be treated as hospital patients, in what relation will the hospitals stand to the new insurance law? This is a question of very vital concern to all of us. If the hospitals as such should be enrolled on the panel, they should be entitled to remuneration for services performed, whether in the house or out-patient departments, just as the unattached physician will be. This would appear to render necessary contract service between hospitals and the carriers, which would place a considerable part of the hospital clinic upon a pay basis. Such contracts would probably bring in considerable incomes to offset the deficits which now make our hospitals a burden on the charitable public.

If the insurance commissioners enter into contracts with hospitals for the care of the children of wage-earners, it would seem reasonable to suppose that the remuneration would have to be at a much lower rate per visit than a private physician on the panel could afford to accept for his services. In a community like Greater Boston, therefore, would not the economic effect of such competition tend to increase greatly the size of the clinics at the expense of the general practitioner? As the staffs of specialistic hospitals are necessarily limited, it is reasonable to suppose that these would gradually develop a hospital caste still more at variance with that portion of the profession which is not affiliated with hospitals than now is the case, with a chance for the injection of medical politics incompatible with the dignity of the profession or the ultimate interests of the public.

The proposed law would provide for supervision of all works performed by the insurance commissions, whether by panel physicians or contract hospitals. If, therefore, the major part of hospital practice is to consist of insured patients, the hospitals are at once brought under direct supervision by a state body, with all its concomitant possibilities of political activities, which would make present medical politics look like child's play in comparison. When the political game is played the public generally suffers. Is there anything in the present bill which guards against such an evil?

It would be a short-sighted and selfish position for us to assume, because the majority of us here probably derive our income from patients earning more than $1200 a year, that we need not be concerned with the outcome of this medical insurance act. Directly or indirectly, every man of us will feel its effect. The disturbing thought that no one can foresee the way in which it will work out, that the bill is framed with very little consideration for the experience or feelings of the medical profession, that there is not the slightest guarantee that the public will get better service than under the present constantly improving conditions of medical practice, make the subject one which, in my opinion, should be very thoroughly considered and discussed by every medical organization in the State.

Specific provision has been made in the insurance bill now before the legislature for the care of the families of wage-earners. This appears to be a logical sequence of the argument in favor of insuring the wage-earner, for the object of medical insurance is to prevent poverty and suffering on the part of the limited wage-earner and his family. To limit the benefit of the act to the wage-earner himself by no means insures the family against the devastating economical effects of illness. A wage-earner with a wife and four children, for instance, is more likely to suffer financially through the illness of the wife and children, than through failure of the health of the wage-earner, and if this social problem is to be solved by medical insurance, is it not of equal importance to include the family as well as the wage-earner himself? An act which protects the workers alone seems likely to fall short of the social need which underlies this sociological movement. If adopted at all, it would seem reasonable to provide for the larger requirements of family practice. If the present bill recognizes this need, the hospitals and dispensaries for children immediately come within the scope of the act, and careful consideration of the details of the law now is desirable.

The parts played by the children's hospitals and dispensaries, in proportion to the total of hospital practice, is very great. The burden of adequate maintenance and support for these institutions is enormous and is borne by a small proportion of the population. If this medical insurance is to become a part of our social organization, supported by the State, the employer and the wage-earner should similarly contribute to an insurance fund which should provide means for proper medical care of the wage-earner's family. As it is now, this burden is borne, for a very large portion of the community, by the hospitals alone, through private philanthropic support. The hospitals, under the proposed acts, *may* be entitled to compensation from the carriers for services rendered to insured wage-earners, and even though the rate of remuneration to be decided upon may be small, as compared with private fees, there is no doubt that the total amount received under the act might prove a considerable and thoroughly justified source of income to the hospital. There is nothing, however, in the act at present which makes compensation *mandatory*. This seems to me a serious defect from the hospital point of view. The wage-earner and his family may choose from the panel his choice of physicians. If hospitals are enrolled on the panel as organizations of specialists, it is reasonable to suppose that its present clientele will continue in large part to apply to them for medical services. If this service is not by law entitled to just compensations, the carriers escape the responsibility of paying for services, for which they would be responsible if rendered by private panel physicians. The hold of our hospitals upon their patients depends more upon the advantages they offer for scientific diagnosis and specially skilled treatment than upon the fact that the treatment is free. Under the proposed legislation the insured would be entitled to free medical care under any circumstances. It is probable, therefore, that the same class of cases which is now appropriate to hospital care, whether in house or out-patient, will continue to apply for treatment. Unless the law makes compensation to the hospitals mandatory, it would seem as if the natural tendency of the carriers would be to shift as much work as possible upon the hospitals so as to reduce to the minimum their responsibility for sick benefits. The result of such a tendency would obviously be to make the hospitals an indirect and involuntary contributor to the insurance fund, instead of a just beneficiary for services rendered. In other words, the State, in its efforts to conserve the health of the children of the insured, would put itself in the position of forcing private philanthropy of the few who support the hospital, to assume the financial responsibility which in justice should fall upon the State, the employer and the wage-earner.

To compensate hospitals for services rendered at the request of the insured, would be equable and just and on a plane with the tax which the public pays in support of its public school. It would ultimately place the hospitals upon a much sounder financial basis than they can ever obtain under the present system of private enterprise and philanthropy.

Any plea for mandatory compensation to hospitals for services rendered to the families of the insured, will be open to the same criticism and objections on the part of the medical profession which may be raised against the bill, however worded or limited. If, however, by force of circumstances and public opinion the State is determined upon the experiment so radical and socialistic as a medical insurance act, it must be framed in such a manner as to be consistent in theory and equable in operation. The bill presupposes that the worker earning $1200 or less cannot afford to suffer through illness the financial loss of his income, which admits no contrary argument. It also presupposes that when the wages continue to be paid by provisions of the act, the wage earner is still unable to meet through his wage benefit the expense of his medical care. It is equally logical to assume that he cannot afford to meet the expense of the still greater possibilities of poverty caused by illness in his family. If he cannot afford to meet the expense of his own illness, with wages continued, we must admit his inability to provide for proper medical care for his family.

It seems to me that the promoters of this bill have set the standard of the man who needs insurance to protect him against poverty much too high. There is much to be said against the arbitrary limit which has been placed at $1200 a year. It is not clear that any distinction is made between the single man earning $1200 a year and one with four or six dependents. There must be some wage so low that the margin of profit for the emergencies of illness would be so small that no private physician of any worth could afford to render medical services for the amount the wage-earner could pay. Medical insurance for such a class would be a distinct advantage to the physician in general practice as well as the wage-earner. The point at which compulsory insurance should become operative is one which, I think, deserves more discussion than has been given it. Personally I believe that the proposed standard of $1200 a year is so high, that it will work great injustice to a very large element in the medical profession, whereas, if the limit was materially lowered to a class which shows no profit to the private physician, a large part of the opposition to the bill would disappear.

Whatever the final decision in regard to this level of compulsory insurance may prove to be, the important point which I would emphasize is the fact that the present bill fails to safeguard the interests of the greatest of all organizations for preserving the public health, the incorporated hospitals which are independent of state and municipal aid. To my mind it is only reasonable and fair that compensation which they render to the insured and their families, should be mandatory and on such a scale that their efficiency may continue and grow so as to meet the ever-increasing demand upon their resources. The welfare and efficiency of the medical profession in the State is directly connected with the prosperity and efficiency of the hospitals. Both as private physicians and as staff physicians, it is our duty to consider with great care the effects upon the hospitals of legislation so radical and revolutionary as the proposed medical insurance act.

CONGENITAL MALFORMATIONS OF THE LOWER BOWEL.

By James S. Stone, M.D., Boston,

Surgeon to The Children's Hospital.

The records of about sixty cases of congenital malformation of the lower bowel seen at the Children's Hospital show certain facts.

The Children's Hospital treats about as many cases of atresia of the anus associated with some abnormal fistulous opening of the bowel as it does cases of complete imperforation.

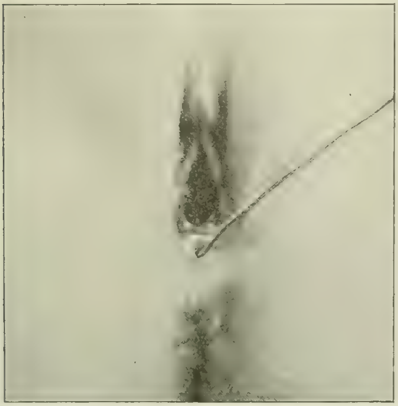
I do not believe this represents the real frequency of occurrence. A complete imperforate anus or rectum causes death within a few days unless relieved by surgical intervention. Many babies thus are either cured or die without ever coming to a hospital. The cases in which there is an abnormal opening of the bowel live, and in time are brought into the larger hospitals because the conditions are puzzling.

The babies brought in with atresia of the anus or rectum present a great variety of conditions. In some there is no evidence at all of any anus, the blind end of the bowel lies well above the brim of the pelvis. In others there is only a relatively thin membrane separating the bowel above from the normal anus below. Between these two extremes there is every intermediate gradation.

Partial occlusion of the rectum by a congenital membrane is occasionally seen. The finger pushed through the membrane in one such case in a baby about four months old, cured the constipation so promptly and so effectively that the opposite wall of the room did not escape.

One of the most persistent cases of stricture of the rectum occurred in a baby first seen when 48 hours old. A few hours before a complete membranous obstruction had broken through spontaneously. At that time nothing abnormal could be felt in the rectum. But for over a year this child needed constantly repeated dilatation of the cicatricial stricture which resulted about three-quarters of an inch inside the anus.

Cases of atresia of the anus associated with rectal fistulae of various forms, which are rarely seen in the practice of any indvidual, come often to the Hospital. The first child with this condition was a girl of five years. There had been no urgent symptoms until she ate a number of cherries, stones and all. The stones had to be pushed along manually through the fistulous tract which led from the rectum and the opening just behind the vagina.



Atresia of the Anus with Recto-Perineal Fistula.

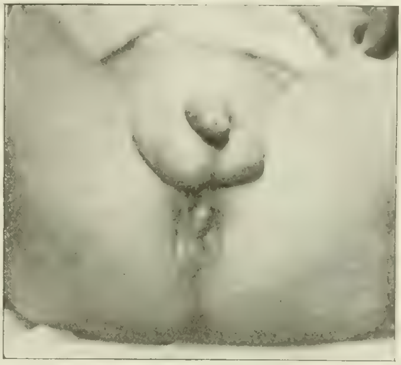
The dimpling and pigmentation of the skin at the normal location of the anus are well shown. An ordinary silver probe is introduced into the congenital fistula, which extends back to the rectum. The patulous opening of the vagina, the absence of the fourchette, and the rounding of the anterior edge of the perineum are well shown. This case is typical of the many in which the opening is in the anterior part of the perineum.

Since then many female babies have been brought in with fistulae opening at the anterior edge of the perineum or in the lower posterior vaginal wall. This condition is one which does not necessarily interfere with life if left absolutely alone.

A few years ago a patient presented herself at the Boston Lying-in Hospital, with the rectal opening well up on the posterior vaginal wall.

Many such anomalies are recorded among women, some of whom have been really more or less ignorant of the extent of their deformities. There have been no urgent symptoms, their mothers have said nothing to them about the deformity, and the girls have grown up in more or less ignorance of the fact that they were not entirely normal. Marriage and childbirth have followed,—the true condition being discovered by the physician delivering them.

A number of male babies have been brought into the Hospital because of the passage of feces through the penis. In some cases these babies have presented urgent symptoms of obstruction of the bowel. In one such instance the child was brought in when twenty-one days old. During that time all meconium feces and gas had been passed through the penis. There was absolutely no anal opening. In other cases there has been a fistulous opening in the perineum close behind the scrotum.



Atresia of the Anus with Recto-Perineal Fistula.

The long congenital fistula leads back to the rectum, at the side of the irregular raphe of the perineum. Posteriorly the puckering of the skin is seen at the normal location of the anus. This illustrates the type often seen in boys.

In order to understand the congenital malformations of the lower bowel, certain embryological facts must be kept in mind. These I will state in a very general way.

The anus develops in the following manner: The anal membrane, formed by the growing together of the ectodern and entodern and the pushing aside of the mesodern, appears in the third week of fetal life. During the following fortnight this membrane becomes depressed to form the anal pit. Meantime the allantois grows out as a diverticulum from the ventral wall of the gut. A part of this later forms the urachus, a part of the urinary bladder, while the short, wide portion nearest the bowel is called the urogenital sinus. Into this empty the Wolffian ducts, the ducts of Müller, and, secondarily, the ureters. The lowest part of the gut nearest the urogenital sinus, is the cloaca, the common termination of the genitourinary system and of the intestinal canal. The anal pit is formed directly opposite the cloaca. In man the cloaca becomes divided into a ventral passage, the true urogenital sinus, and a dorsal canal, the rectum. The partition which separates these two passages, and which ultimately becomes the perineum, is formed by the growth of three ridges or folds, one pushing down from above from the junction of the urogenital sinus and the gut, the other two growing inward, one from each lateral wall of the cloaca. The anal pit shares in this division, the posterior part remaining the anal pit proper, the anterior part forming the orifice of the urogenital sinus. The division is complete by the fourteenth week of fetal life. The anal pit deepens, the anal membrane being thereby approximated to the end of the bowel. In the fourth month the anal membrane breaks down and disappears, leaving the lower end of the intestinal canal patent.

Owing to defects in development, occurring in early fetal life, four distinct types of congenital abnormality of the anus and rectum are recognized.

In the first type the anal pit or depression is not formed as is normal. There is then an absence of the anus. In the second type of cases the anal membrane persists. There is then no connection between the bowel and the anus. There is an imperforate anus or rectum, A similar condition may also be due to defective development of the rectum itself. In the third type the anal membrane disappears only in part. There is then a congenital stricture of the rectum. In the fourth type the partition between the urogenital sinus and the rectum does not develop normally. In certain cases the fold which should grow downward from the junction of the urogenital sinus and gut to unite with the folds pushing in from the sides, may be defective. Under these circumstances there remains a communication between the rectum and the bladder or urethra in the male, or between the rectum and vagina in the female. These malformations are usually associated with imperforate anus. They are not the result of the imperforate anus, because the sputum, which divides the rectum from the urogenital sinus, is normally complete before the anal membrane disappears. It is perfectly possible that the failure of the anal membrane to disappear may be due to the fact that an abnormal communication persists, giving an exit from the rectum. Presumably, after the disappearance of the anal membrane any abnormal communication between the rectum and the bladder or vagina would tend to close spontaneously. In other cases the fold growing from above develops normally, while the folds from either side of the cloaca may

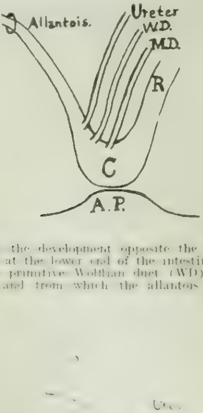


DIAGRAM 1. shows the development opposite the anal pit (AP) of the cloaca (C) at the lower end of the intestine (R) into which empty also the primitive Wolffian duct (WD) and the duct of Muller (MD), and from which the allantois leads out to the umbilicus.

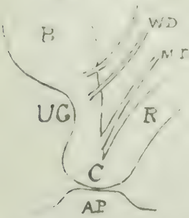


DIAGRAM 2 shows the differentiation of the allantois into three portions: the urachus, the bladder (B) and the urogenital sinus. The beginning division of the cloaca into an anterior and a posterior portion is also indicated.

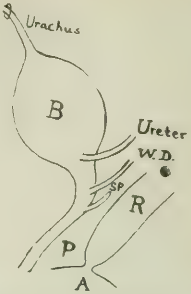


DIAGRAM 3. shows the further development in the male, the Wolffian duct (WD) becoming the vas deferens, and the duct of Müller becoming the insignificant sinus pocularis (SP) or uterus masculinus.

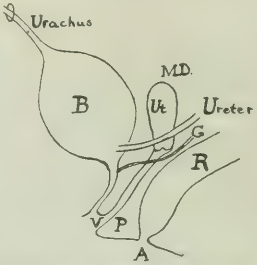


DIAGRAM 4. shows the corresponding development in the female. The Wolffian duct becomes the insignificant canal of Gärtner, while the duct of Müller (MD) becomes subdivided into the vagina, uterus and Fallopian tube.

In each of the last two diagrams the development of the perineum is complete. By growth downward from the point between the duct of Muller and the rectum and by growth inward from the two sides, the perineum (P) is formed.

unite irregularly or incompletely. The true anus does not develop. The abnormal fistulous opening in the anterior perineum implies a lack of development of the anal pit associated with a partial failure of union between the sides of the perineum. The location of the abnormal opening of the rectum is presumably determined in good part by the development of that portion of the perineum which grows down from above. Thus, as just stated, when this portion is markedly undeveloped, the bowel opens into the bladder in the male or into the upper vagina in the female. If the abnormality is due to defective fusion of the three parts of the perineum, the upper and the two lateral, then the opening of the rectum is lower down, either in the lower vagina or in the perineum, or, in the male, in the urethra.

The abnormality is seen more commonly in the female than in the male. This may be due in part to the fact that in the female the duct of Müller which develops, is differently situated from the duct of Wolff, which in the male develops into the vas deferens,—the duct of Müller remaining undeveloped. In the male the abnormal opening, if external, may be situated anywhere in the median line of the perineum or scrotum, in the peno-scrotal angle, or the under surface of the penis; or if internal, at any point in the bladder or urethra.

Among the reported cases in males, however, the most common point of external opening is in the anterior part of the perineum, at the base of the scrotum, or in the scrotum or peno-scrotal angle, while the internal opening is usually into the bladder, much more rarely into the urethra, near the peno-scrotal angle. In females, the most common point of opening externally is at the posterior edge of the vulvo-vaginal orifice. Internally, the opening may lead into the vagina. The interposition of the vagina prevents an opening into the bladder or urethra in the female.

The accompanying diagrams may give a clearer idea of the conditions. They are taken largely from Heisler's "Embryology."

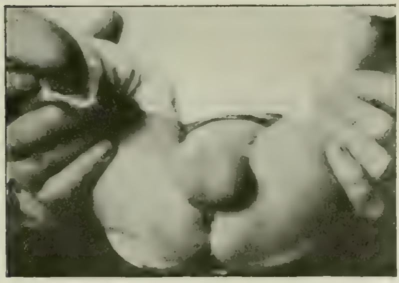
The most common location of the opening is thus in the anterior part of the perineum in both sexes. Presumably the fistula is situated most frequently along the line of junction of the three component parts of the perineal body. The frequency of the types of malformation among reported cases undoubtedly depends chiefly on the risk to life of the various forms.

In certain cases, while the anus is normal, the development of the partition between the gut and the urogenital sinus may be imperfect. This condition is more common in the female than in the male. In this manner are to be explained the valve-like openings which have been reported connecting the rectum and vagina. In the same way, perhaps, may be explained the cases of rupture of the posterior vaginal wall into the rectum, resulting from what must be under normal conditions insufficient trauma to account for such an accident.

The symptoms vary greatly with the age of the child. In young babies the malformation is not apt to give rise to serious trouble because of the soft character of the feces. In older children, as the movements become more solid the difficulty of defecation increases. Dilatation of the bowel above is apt to occur, and, of course, more serious complications may arise. The chief dangers are obstruction of the narrow outlet by some foreign body or particularly hard fecal mass. In those cases in which the bowel communicates with the bladder or urethra, the dangers of urinary obstruction or infection are always present.

Cases in which there is no opening of the bowel, demand immediate operation. The perineal route should be chosen in all cases in which distinct bulging of the lower bowel can be felt below. The one essential point in the operation is to secure firm hold of the lower bowel and sufficient mobilization of the lower bowel before it is opened. Unless these precautions are taken, the minute the distended bowel is opened it at once collapses and recedes, and all the tissues are completely smeared and rendered unrecognizable by the thick mass of meconium which escapes. In cases in which no bulging mass of bowel can be felt in the perineum or with the finger inserted in the anus, it is far wiser to open the abdomen above. In many cases the blind end of the bowel lies free within the abdomen and sufficiently movable to allow it to be brought down easily to the anus, even when any attempt to reach it from below would be entirely vain. In other cases where the rectum is more fixed, there may be a gap in the bowel so wide that it is impossible to reach the blind end from below, or even at the first operation to push the blind end down from above. Under these conditions, the sole resort must be a colostomy.

In other cases still, in addition to the malformation in the rectum, there may be congenital occlusions higher up in the bowel. In some of these cases an anastomosis will give a chance of cure. In other cases, a large portion of the bowel is defective. I have seen a number of cases in which the esophagus, stomach, duodenum, and a couple of loops of jejunum are perfectly normal, and in which the rest of the small intestine, appendix, and all of the large intestine, down to the rectum, exist in miniature. The extent of this rudimentary condition of the bowel varies considerably, but where it exists, the lack of development is usually so great as to render life absolutely impossible. There is not enough bowel from which absorption of food can take place. In the less extreme cases an anastomosis may be performed. In most cases, even if successful, this would merely substitute death by starvation for death by obstruction. The need of primary abdominal operation cannot be urged too strongly in the cases in which distinct



Case of Atresia of the Anus.

Recto-vesical fistula. Complete absence of the penis. There was a needle-point opening in the perineum through which a few drops of urine escaped. The puckering of the skin is seen at the normal location of the anus. This illustrates an extremely rare combination of anomalies.

bulging in the perineum cannot be felt. The children, at best, are weak, are suffering from intestinal obstruction, and many of them may have other malformations. The factors of loss of time, of hemorrhage, of shock, and of added risk of sepsis, are usually enough to turn the scale against the child in cases in which a primary abdominal operation might have been successful. The risk of wounding the bladder in these cases is bery great unless the rectum can be easily felt.

Cases in which, in the male, there is an opening between the bowel and the bladder or urethra are not as extremely urgent as are the cases of complete obstruction. Boys have been brought into the hospital, three weeks old, where all the feces and all the urine were passed through the urethra. Of course this condition cannot go on indefinitely. Sooner or later feces will enter the urethra, become caught there, and then there will be not only obstruction of the bowel, but obstruction to the passage of urine.

In girls, where there is a fistulous opening into the vagina, there is no great urgency for surgical intervention. During the early months of life, while the feces are soft, they are passed readily through the fistula. It is only when they become formed and abnormally hard that there is any tendency to intestinal obstruction. Under these conditions an impacted fecal mass will be formed in the lower bowel, and around this mass a certain amount of soft liquid feces and mucus will pass. Under these conditions it is common to find the bowels moving with undue frequency, but in small amount. At the same time, the constitutional symptoms of chronic obstruction are slowly developing. Surgical intervention should be postponed in these cases as long as the bowels move normally through the fistulous tract without the retention of any fecal matter above. The surgical treatment, then, must aim at the removal of the fistulous opening, the displacement backward of the bowel to its normal location, and the closure of the perineum, from which the fistula and bowel have been removed. The difficulties of operation are considerable. In the female especially, the partition between the rectum and vagina is usually unduly thin, and the rectum has a course more nearly vertical than normal. The utmost care must be taken when separating the posterior vaginal wall from the anterior rectal wall, not to perforate either mucous membrane. It is absolutely essential that the whole lower rectum be completely mobilized. It must be dissected free for a sufficient distance upward, to allow it to be displaced to its normal position backward and held there without the slightest tension. It is perfectly certain that some sepsis will occur. In an adult it is possible to prevent a movement of the bowels for a number of days, allowing sufficient time for any perineal wound to heal. In children, this is absolutely out of the question. Because of the chance of infection and the amount of ooze of blood and serum from the wounded surfaces, a small rubber dam drain for a day or two is desirable.

In all cases in which there is a puckering of the skin at the normal location of the anus, a sphincter muscle is present. It is important to save this if possible. Of course it must be cut across, but if the incision is made from the middle of the dimpled area directly backward in the median line, no great damage is done. This holds true in operations for complete imperforation as well as in cases in which the rectum is to be transposed to its normal position, in cases with perineal fistula.

In some cases it has seemed wise, on account of the condition of the child, not to attempt at first any radical reposition of the lower rectum, but simply the formation of a new opening between the rectum and the normal anus. Under these conditions the fistulous opening remains. It may empty into the perineum, or the urethra or bladder, or the vagina. Under these conditions, most of the feces may be passed through the new opening made at the location of the normal anus, but in a number of such cases, especially in boys, the small opening between the urethra and the rectum has remained patent, allowing the passage of a small amount of urine into the rectum, and at times allowing the feces to pass into the urethra.

The risk from the passage of feces into the urethra is very decided. Not only is there the danger of cystitis and consequent pyelitis, but there is also the risk of obstruction of the urethra, which in one case of a boy three years old led to a rupture of the urethra and extravasation of urine.

The question will naturally arise as to the advisability of a temporary colostomy in these cases, while the operative wounds made below are allowed to heal. In older children this may be wise. In infants colostomy involves very serious risks. Prolapse of the bowel through the wound is common. Infection of the intestinal tract may occur.

As to after-care, a warning should be spoken. Our statistics show a very considerable ultimate mortality of atresia of the anus. In this mortality, various factors must be considered. Many children have, in addition to the malformation of the anus, other congenital troubles, perhaps congenital heart trouble, which may weaken them.

ATRESIA OF ANUS.

Recto-perineal fistula. Complete exstrophy of bladder and epispadias. Double inguinal hernia. A combination of malformations which is fortunately rare. It is noteworthy that the mother of this boy had later a baby with spina bifida, but that this baby was by her second husband.

Recurring stricture of the rectum with chronic intestinal obstruction often comes on so insidiously as to be neglected.

Infection of the intestinal tract as well as infection of the urinary passages are to be considered and guarded against.

The necessity of skilled after-care for many months cannot be emphasized too strongly.

DISCUSSION

Dr. Mixter: Dr. Stone has asked me to say a little something about exstrophy as one of the congenital malformations of the bladder which we meet with at the Children's Hospital. I think this malformation can best be imagined by introducing a knife at the meatus, passing it through the urethra to the bladder and along the urachus to the umbilicus. If, now, the incision is carried forward and all the structures anteriorly are divided, the condition represents a complete exstrophy—epispadias is always present, the symphisis is divided and the ends separated, the posterior bladder wall extrudes, revealing the uterus at the lower portion and the divided umbilicus forms the upper margin. Double inguinal herniae are present.

The question as to what a physician should say when a case of exstrophy is brought to him is to me a very puzzling one. It luckily is of rare occurrence, about once in 50,000 children, but the mortality of the untreated cases is very high. It is estimated that 90% die in infancy or early childhood, and when the rare case grows to adult life, existence is perfect misery with the constant dribbling of urine, tenderness of the bladder, etc. On the other hand, what has operation to offer? In any operative procedure, to be satisfactory, you have to obtain some kind of sphincteric action for the control of the incontinence. That gives a fundamental objection to all the plastic operations on the bladder itself. On the other hand, the transplantation operations to introduce the ureters into the intestine is followed by a very high mortality, from anuria and from pyelonephritis. We have had eight cases, I think, at the Children's Hospital, and the infants that Dr. Stone reported the other day, and of those cases four died within several weeks after operation; three died before the end of the year, and only one is at present alive, seventeen months after operation. This child was a case I operated on a year ago last September. Last April I saw the youngster, and up to that time he had been fairly well.

Then he developed a very severe pyelonephritis with a large amount of blood in the urine passed by rectum and his general appearance indicated a rapidly fatal termination. He weathered that attack however, and at the present time is in good shape. It is possible that he will have another attack of pyelonephritis in the future and it is still impossible to foretell the ultimate outcome.

It is probable that in the future we can decrease the very high mortality. Dr. Cabot has suggested the use of vaccines in immunizing prostatic patients before operation to lessen the chance of pyelonephritis. This procedure might be found applicable before transplantation in exstrophy. A two-stage operation has been suggested,—first implanting the right ureter, for example, into the caecum and later the left into the sigmoid. It may even be found that the insertion of the ureters into the small intestine fairly high up where the tract contains fewer organisms, is feasible.

Even with the high mortality of the transplantation operation it seems to me no greater than the mortality you are bound to have if you leave the cases untreated: I think that it is at the present time the only satisfactory operation in certain cases. If you leave the children alone and they do grow up they are in perfect misery. If you operate on them they are pretty comfortable, as is this youngster that I spoke of. He is at present voiding by rectum 4 or 5 times a day and he gets up about once in the night. I think that the time preferable for an operation would be somewhere between three and four years, before the children go to school where they prove very objectionable to their associates. I believe that as a preliminary measure it would be well in cases in which there is definite separation of the symphysis that some orthopedic appliance should be used to bring the pubic bones together.

Dr. Stone (in closing): The only thing to add is that many cases of imperforate anus have a communication between the bladder and the rectum which the physician or surgeon is apt to attribute to some mistake in operative technic. It should be clearly understood that while this may be the case, in the majority of instances the communication is but a part of the congenital defect.

ABSTRACT OF PAPER ON A CASE OF CONGENITAL CARDIAC DISEASE.

By Charles Hunter Dunn, M.D., Boston.

The clinical report was that of a case in which the diagnosis of congenital cardiac disease was obvious from the physical examination of the heart. The presence of a palpable systolic thrill, of persistent cyanosis, and of cardiac enlargement, suggested the presence of pulmonary stenosis. The fact that the child survived for fifteen months suggested the presence of some additional compensating lesions, either defective interventricular septum, or open ductus arteriosus. The absence of a humming-top murmur, or the transmission of the murmur into the vessels of the neck suggested that the additional lesion was defective interventricular septum rather than open ductus arteriosus. The characteristics of the temperature chart, the positive von Pirquet reaction, and the presence of the palpable mass in the intestine suggested the diagnosis of chronic tuberculosis with a primary lesion in the intestine, and involvement of the mesenteric lymph-nodes, with the additional possibility of tuberculous peritonitis. The clinical diagnosis, therefore, was as follows:

Pulmonary stenosis.
Defective interventricular septum.
Chronic intestinal tuberculosis.
Chronic tuberculosis of the mesenteric lymph-nodes.
Possible tuberculous peritonitis.
Rickets.
Terminal bronchopneumonia.

At autopsy the heart showed very marked enlargement. The point of origin of the aorta and pulmonary arteries, respectively, were reversed, the aorta arising in front and to the right, and the pulmonary artery behind and to the left. The foramen ovale was entirely open. The tricuspid and mitral valves were normal except for the widening of the orifices produced by the dilatation of the ventricles. There was some hypertrophy of the wall of the left ventricle, and marked dilatation of the cavity of the right ventricle without notable hypertrophy of the walls. The aortic orifice was situated, not in the left ventricle, but in the right ventricle somewhat further forward than the normal position of the pulmonary orifice. It was otherwise normal. The pulmonary orifice was situated in the left ventricle in the position normally occupied by the aortic orifice. It showed marked stenosis. There was an oval opening in the ventricular septum, 5 cm. in diameter, situated in the usual position of the lesion, namely, just below the normal position of the aortic orifice.

The principal interest in this case lies in the transposition of the great vessels, which is a comparatively uncommon lesion in congenital cardiac disease. There are two forms of transposition of the great vessels. In one form the aorta arises in front and to the right, while the pulmonary artery arises behind and to the left, but nevertheless, each vessel opens from its proper ventricle, the aorta from the left ventricle, and the pulmonary artery from the right ventricle. This form is called corrected transposition.

In the other form, not only is the position of origin of the great vessels reversed, but the aorta opens from the right ventricle, and the pulmonary artery from the left ventricle. This is called complete transposition, and is the form which we have here. Complete transposition of the great vessels is a comparatively rare lesion in congenital cardiac disease. In most of the reported cases the lesion has been accompanied by other lesions, particularly by pulmonary stenosis and defective interventricular septum, as in this case. When this combination occurs, the diagnosis of complete transposition is impossible, the only physical signs being those of the accompanying additional lesions. There are a few reported cases in which the complete transposition was the sole lesion. In these cases the only clinical manifestation was persistent cyanosis, there being no murmur and no notable cardiac enlargement.

The most plausible explanation of the lesion is that of Rokitansky. In the conus arteriosus which forms the upper part of the primitive aorta, the formation of the transverse aortic septum places the lumen of the aorta in front. The torsion which brings the opening of the aorta behind is due to a kinking in the bulbus cordis, which forms the lower part of the primitive aorta and pulmonary artery. This torsion is represented by the spiral arrangement of the septum in the bulbus cordis. If this normal kinking and torsion does not occur, or is slightly reversed, the aorta will arise in front and to the right, the pulmonary artery behind and to the left. In the first form of transposition there is a sympathetic adjustment of the interventricular septum in its union with the aorta-pulmonary septum, which causes each great vessel to open into its proper ventricle. This form is called by Rokitansky "corrected" transposition. In the second form the interventricular septum unites with the malposed aorta-pulmonary septum without sympathetic adjustment, causing the aorta to open from the right ventricle and the pulmonary artery from the left ventricle. This is called "complete" transposition.

The remarkable feature of this case is that the child should have lived so long, especially with the additional handicap of chronic abdominal tuberculosis. The transposition of the great vessels must produce a very serious disturbance of the circulation. The venous blood returning to the right side of the heart from the venae cavae is sent right out again through the aorta, while the aerated blood returning to the left side of the heart from the lungs is sent out again through the stenosed pulmonary artery. The only way in which any venous blood can be aerated is by passing through the open foramen ovale, or open ventricular septum into the left side of the heart, often being sent out through the narrowed lumen of the pulmonary artery. With lesions of this extent, it seems quite remarkable that the patient should have attained the age of fifteen months.

ARE CARIOUS TEETH A CAUSATIVE FACTOR IN ENDOCARDITIS?

By Elmer W. Barron, M.D., Boston, Mass.

This paper is a summary of the study of the recorded physical examinations and personal histories of 218 children operated upon for either tonsils or adenoids or both at the Forsyth Dental Infirmary during the past few months. The examinations are routine previous to the administration of anaesthetics, but the attempt has been made to make them as thorough and complete as possible.* The histories have been taken with considerable detail.

The statistics here presented are intended as a preliminary report of some of the work now being done at the Forsyth, and I have no intention of answering the question which is the title of this paper, nor shall I make any attempt to draw conclusions.

Furthermore, I shall make no attempt to prove that a certain per cent. of these children had heart lesions, and no data for that purpose will be given. The results of the examination simply represent the opinion of the examiners, at one examination, that such lesions existed, and no case has been included except those thought definitely to present sufficient evidence of organic lesions.

In working out a form to be used in obtaining the histories, pains were taken to include every disease which could be found given as an etiological factor of endocarditis in the works of several different authors. Nowhere did I find any mention of carious teeth, as such, unless they be included under the general statement with which nearly every list is concluded, "that pyaemic and septic conditions may be the cause of endocarditis." That carious teeth may furnish a primary source of infection in some cases of tonsillitis and rheumatic fever, to which endocardial lesions are obviously secondary, is a phase of the question, impossible of proof, but not to be forgotten.

It is to be remembered that none of these children were operated upon because of any abnormalities, found at their examinations, or because of their past histories, but only for dental or nasopharyngeal indications, so that they are in no sense selected cases, from the point of view of the internist.

There have been no pathological examinations of any of the tonsils after removal. When they have been found to be obviously diseased a history of tonsillitis has usually been obtained.

Of the 218 children, 51, or 23%, were found to have endocardial lesions. There were incomplete records in five instances, two with heart lesions and three without, and these cases were excluded, so that the corrected figures still give 23%.

Table I shows the number of illnesses from which a heart lesion might have been acquired with which these 49 children had suffered; growing pains, so called, are included under rheumatic fever, and under grippe has been placed one child from whom was obtained a story of a "very severe cold" lasting a considerable length of time.

Table II shows the total number of carious teeth each child had, the total extractions (badly carious) and the total number of cavities filled (not badly carious).

Measles is said to cause endocarditis only very rarely; pertussis and mumps I was unable to find mentioned in any text-book specifically as causes, except that they might be included under a general statement that any infection may be a causative factor; and pleurisy with effusion is certainly rarely followed by endocarditis. Chicken pox is mentioned by a few authors.

There are 17 of the 49 who had no disease so far as could be ascertained or only one or more of those diseases just mentioned, and in Table III will be found a tabulation of them with the number of teeth extracted, filled and total carious. Seven of the seventeen, (Nos. 17, 20, 23, 25, 26, 27 and 35) had ten or more carious teeth, two (Nos. 7 and 29) had nine; two (Nos. 38 and 40) had eight; one (No. 44) six; two (Nos. 30 and 42) five; one (No. 49) four, and one (No. 48) had but one.

Three of the children (Nos. 23, 48, 49) had had no illness, of whom one (No. 48) had but one carious tooth; one (No. 49) had four extractions, and one (No. 23) had twelve carious teeth of which three were extracted. Six had had measles only; one (No. 25) had four extractions and eight fillings; two (Nos. 17, 26) had four extractions and six fillings; one (No. 29) had one extraction and eight fillings; one (No. 7) had nine fillings, and one (No. 30) had one extraction and four fillings. One child (No. 27) had had chicken pox only, but twenty-two carious teeth, of which it was necessary to extract eleven; one (No. 38) had had mumps only, with eight carious teeth, six of which were extracted. One (No. 20) had had measles and pleurisy with effusion, but had sixteen carious teeth, fifteen of which were filled. Number 35 gave a history of measles, chicken pox, pertussis and mumps, but she also had sixteen carious teeth, of which ten were extracted. Number 40 had had chicken pox, pertussis and mumps with eight carious teeth, five being extracted. Number 42, measles, pertussis and mumps, with five carious teeth, two being extracted and three filled. Two children (Nos. 44, 47) had measles and pertussis, the former with three extractions and fillings, and the latter five extractions.

I hope at a later date to present a larger number of cases with more complete data.

DISCUSSION.

Dr. Eustis: I am very much surprised at the small number of cases that give a history of rheumatism and chorea. I have no figures to compare with Dr. Barron's, but my general impression obtained from seeing the cases of heart disease at the Children's Room at the Massachusetts General Hospital, is that a greater proportion of them give a definite history of some rheumatic affection in the past. I have seen a few cases where I have been able to find no other etiological factor than badly carious teeth. I am not prepared to say though, that the teeth are the cause of the endocarditis. I think another source of error in drawing any conclusions is the great difficulty in determining whether or not a given heart has a mild degree of endocarditis, or merely has a functional murmur or some slight functional irregularity. I should like to ask Dr. Barron what his criteria were in determining whether or not a case was one of endocarditis or merely had a functional heart murmur. I have had the greatest difficulty myself in doing so, and have put myself down in black and white, only to find myself wrong a few months later. With a single examination in many cases, it is nearly impossible to determine just what the condition is.

Dr. Dunn: I must confess that I have been very much impressed by all this work of Rosenow on the infections so that personally I have become rather enthusiastic. If his views about the infections

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* The examinations were made by the writer and Dr. Edward Martin, to whom I feel greatly indebted.

CHART I.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	20	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	T'l
Measles	+	+		+	+	+	+	+		+						+	+	+	+	+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+		+		+	+	+	+		+	+			35
Tonsillitis	+	+	+	+	+	+					+	+	+		+	+		+	+			+		+				+			+					+			+						+	+				21
Pertussis	+	+		+				+	+									+	+		+			+							+	+	+	+	+					+		+	+	+	+		+			20
Chicken pox		+		+				+							+						+	+		+			+						+	+	+	+	+		+	+										15
Mumps		+		+							+		+									+		+								+		+	+			+	+	+		+	+		+	+				16
Diphtheria									+									+	+					+								+		+					+				+							8
Rheumatism				+	+				+										+		+																													5
Scarlet Fever						+								+																		+	+	+			+													6
Pneumonia									+	+		+										+																			+									5
Grippe								+		+				+																																				3
Pleurisy with Effusion																				+																														1
Chorea				+																																														1
TOTALS	3	5	1	7	3	3	1	4	4	3	2	2	2	2	2	2	1	4	5	2	4	5	0	6	1	1	1	2	1	1	3	5	4	6	4	3	3	1	5	3	2	3	4	2	3	3	2	0	0	

CHART II.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Teeth Extracted	3	10	1	0	1	1	0	0	0	0	0	0	0	4	0	3	4	1	3	1	2	6	3	3	4	4	11	10	1	1	0	10	0	1	10	0	3	6	0	5	6	2	5	3	2	1	5	1	4
Teeth Filled	8	4	5	8	8	1	9	5	3	2	2	0	12	8	0	5	6	15	0	15	5	5	9	8	8	6	11	4	8	4	1	12	5	5	6	4	3	2	3	3	1	3	4	3	2	0	0	0	0
TOTAL CARIOUS	11	14	6	8	9	2	9	5	3	2	2	0	12	12	0	8	10	16	3	16	7	11	12	11	12	10	22	14	9	5	1	22	5	5	16	4	6	8	3	8	7	5	9	6	4	1	5	1	4

CHART III.

	7	17	20	23	25	26	27	29	30	35	38	40	42	44	47	48	49	T'l
Measles	+	+	+		+	+		+	+	+			+	+	+			11
Pleurisy with Effusion			+															1
Chicken-pox							+			+		+						3
Pertussis										+		+	+	+	+			5
Mumps										+	+	+	+					4
Teeth Extracted	0	4	1	3	4	4	11	1	1	10	6	5	2	3	5	1	4	
Teeth Filled	9	6	15	9	8	6	11	8	4	6	2	3	3	3	0	0	0	
Total Carious	9	10	16	12	12	10	22	9	5	16	8	8	5	6	5	1	4	

prove to be final, it is going to have a revolutionary effect upon many of our theories, and among the diseases more affected rheumatism and endocarditis will take the first rank. Briefly stated, his theory is as follows:

Bacteria belonging to the streptococcus-pneumococcus group may in certain conditions of growth and environment, such as may be found in various focal infections, become transmuted in their cultural and biological characteristics, and may take on a selective affinity for certain tissues of the body. Now if this is so, it is certainly suggestive bearing on this action of carious teeth in endocarditis. Of course in rheumatic fever we have just the sort of chronic focal infection in which the acquirement of selective affinity is supposed especially to take place, and with carious teeth we may have the particular focal infection which leads to such conditions as endocarditis and rheumatic fever.

DR. BARRON (in closing): I cannot account for the small number of cases of rheumatism and chorea in this series, except on the theory that we have not been thorough enough in getting histories of them. We have tried to be—that is all I can say. While some rheumatic conditions may have gotten by us, growing pains is one of the things we have asked for in every case. I realize that a single examination, as has been suggested, is not always perfectly reliable, and one cannot always say whether the children have heart affections or not, and therefore, from this list has been excluded everything which might be functional. It has been the aim of Dr. Martin and myself not to include in this list anything which was not obviously a chronic endocardial lesion. It is likely, I presume, that there are among these forty-nine children some, an examination of whom a year from now might show practically normal hearts. I have presented this paper in the hope of stirring up free discussion. If we keep on with the present work we can perhaps prove something definitely, as we have a tremendous number of children to draw from at the Forsyth Dental Infirmary. It does not seem to me that the statistics given on these charts prove anything at all. They simply suggest the possibility that carious teeth may have been the etiologic factor in some cases.

PLYMOUTH DISTRICT MEDICAL SOCIETY.

The annual meeting of the Plymouth District Medical Society was held at 11 a. m. on Thursday, April 19, 1917, at Brockton, Mass. After the discussion of important matters the following officers were elected for the ensuing year: President, Nathaniel K. Noyes of Duxbury; Vice-President, Gilman Osgood, of Rockland; Secretary and Treasurer, Alfred C. Smith, of Brockton; Reporter, Alfred C. Smith, of Brockton; Commissioner of Trials, Francis J. Hanley, of Whitman; Censors: Fred J. Ripley, Supervisor; Walter W. Fullerton; James H. Drohan; Joseph Frame; Richard B. Rand; Councillors: A. Elliot Paine, Nominating; Frank G. Wheatley, Alternate; Gilman Osgood; Alfred A. MacKeen; Fred J. Ripley; Orator for 1918: Frank E. Wheatley, of No. Abington.

The annual oration for 1917 was delivered by Dr. Nathaniel W. Faxon of Stoughton, Mass.* Luncheon was served at the close of the meeting.

Book Reviews.

Anatomical Names. By Albert Chauncey Eycleshymer, B.S., Ph.D., M.D., Head of the Department of Anatomy, University of Illinois; assisted by Daniel Martin Schoemaker, B.S., M.D., Professor of Anatomy, St. Louis University. New York: William Wood and Company. 1917.

Those who are familiar with the author's unique atlas of frozen sections will welcome his latest contribution to the science of anatomy. This volume is a historical study of anatomic nomenclature, with especial reference to the Basle Nomina Anatomica. In his preface he sketches this history, and outlines the work of the commission of the German Anatomic Society, to whom we owe the Basle nomenclature. The book consists first of a translation of the original report of this Commission, written by Dr. William Hiss, with the tabulated names of the new terminology, and an appended explanation of the plan of their adoption. This is followed by a series of biographical sketches by Roy Lee Moodie, A.B., Ph.D., of the proper names associated with the history of anatomy, especially those preserved by their application to structures in the body. These sketches are arranged in an alphabetical list, from Abano to Zsigmondy. The second half of the volume consists of an alphabetic index and synonym register of B. N. A. terms, with their principal Latin and English equivalents.

In these days when anatomic nomenclature is still plastic, though no longer chaotic, the value of such a work to teachers and students is obvious. Apart from its usefulness as a work of history, it will be found of constant value for reference. Those who regret the disappearance of the proper names of distinguished anatomists from the terminology of the science will, to some extent, find consolation in the biographic preservation of the fathers of the science in this work.

General Surgery. By Albert J. Ochsner, M.D., F.R.M.S., LL.D., F.A.C.S., Surgeon-in-Chief Augustana and St. Mary's of Nazareth Hospitals; Professor of Surgery in the Medical Department of the State University of Illinois. Vol. ii of The Practical Medicine Series, comprising ten volumes on The Year's Progress in Medicine and Surgery; under the general editorial charge of Charles L. Mix, A.M., M.D., Professor of Physical Diagnosis in the Northwestern University Medical School. Chicago: The Year Book Publishers. 1917.

The present volume is the first since Dr. John B. Murphy's death. Dr. Albert J. Ochsner, editor for 1917, pays a glowing tribute, in the introduction, to Dr. Murphy. He outlines his character, his reputation, his personality, his ability as a teacher, and the contributions which he made to surgery. Dr. Ochsner's is an appreciation, rather than an analysis; a tribute of friendship, not a critical estimate; a man is fortunate to leave behind him, not only an honored name, as did Dr. Murphy, but also competitors and contemporaries who were invariably friends; this is not often true, even in Chicago.

Under the title of Anesthesia, the dangers of gas oxygen are emphasized; twenty-six fatalities are recorded by Teter, nine in Cleveland; Rovsing mentions thirteen others; Gwathmey knows of "twenty to forty unreported deaths." These figures are truly startling when one considers that gas oxygen has been loudly praised as the safest of all anesthetics. Apothesine is not mentioned under the title "Local Anesthetics." The paragraphs dealing with the Carrel method of wound treatment are certainly not enthusiastic; this is unfortunate, for, notwithstanding its technical difficulties, the method is one of the greatest contributions to surgery which the war has produced.

More than one-third of the book (two hundred and twenty pages) is devoted to abdominal surgery, including hernia. Fractures cover a trifle more than twenty pages; this is a rather striking disproportion.

The book is of the familiar size, five by seven, and contains six hundred pages. It is well printed and bound and, on the whole, well illustrated. It is valuable far beyond its price, and should be within reach of every surgeon.

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* See Journal, page 167.

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CAMOUFLAGE.

The excessive loss of the members of the medical corps in the present war calls attention to the measures that are being adopted to lessen it. One of these has been described in a recent issue of the Journal in a letter from a neutral observer with the German army at the front, and no doubt the Allies have adopted the same plan, namely, to keep the surgeons away from the firing line, leaving the first-aid measures to be employed by the common soldiers for their comrades, on the battlefield, the surgeons being placed at the ambulance stations, the rail heads, and the base hospitals. Another means of preventing injury and death in the medical corps is one that applies in like measure to the other branches of the service, concealing coloration and patterning like the background the soldiers, cannon, aeroplanes and ships, the so-called camouflage of the French.

As long ago as 1896, Abbott H. Thayer, the American artist, described the principles which underlie protective coloration in the animal kingdom in an article in *The Auk.* His ideas were amplified in a monograph of 260 quarto pages with 16 colored plates and 140 figures, written by his son, and published by the Macmillan Company in 1909. This book was circulated in Europe, and has formed the basis of the efforts to make invisible the fighting forces now at war. Uniforms simulate the backgrounds, the faces of the snipers are painted, branches of trees hide the cannon from the aeroplanes, warships are made to counterfeit the sea by coloration and wave patterns.

The principle of camouflage is best understood by the artist rather than by the average citizen, for the artist is trained to reproduce nature as the eye sees it in its surroundings, under given conditions of light, and he, because of his training, gauges the effects of light and shade and pattern on distinguishability. Mr. Thayer showed that terrestrial animals are made inconspicuous by being colored darker on their backs and lighter on their bellies, when not seen against the sky. As the sunlight comes from the sky above, and most of the lighting falls on the animal's darker back, the dark color of the animal's back and the sunlight cancel each other, and thus the gradation of light and shade, that ordinarily serves to distinguish solid objects to the eye, is effaced, and the objects appear to be perfectly flat. Turn a dog lying on the ground on its back, exposing its lighter under side, and note its increased visibility. In this case the light of the belly is accentuated by the white light from above, and the dark of the back becomes darker by the shadow.

If, in addition to the arrangement of light and shade in the animal's coat, the skin mimics its nearby background in color, in pattern, or in both, its visibility to the eye of the observer is diminished. An important consideration in the study of inconspicuousness is the point of view of the observer and the position of the observed. The hawk sees the rabbit blended with the dead leaves over which it runs, whereas the fox, from his position near the ground, may see his quarry outlined against the sky, and therefore brought into sharp relief. The aeroplanist must study the question of distinguishability from an entirely new standpoint; objects on the earth do not appear the same from the sky as when viewed from the level of the ground. To the crouching lion the zebra with its stripes of black and white, imitating its background of reeds and sticks, is relatively inconspicuous so long as it is not outlined against the sky. The important factor in camouflage is, then, obliterative shading of the object, and the secondary factors are, mimicry of the background of the object in color and pattern, and the adaptation of these to the differing points of view of the observer.

At last Mr. Thayer's discoveries have taken root in this country, where they originated, and now a company of artists is at work in a camp in Connecticut studying the problems of camouflage for the benefit of the American army and navy, and it is to be hoped that results useful to the service and to the country will follow.

RECALLED TO LIFE.

A new journal, entitled *Recalled To Life,* is being published in England under the editorship of Lord Charnwood and Everard Cotes, and is to be devoted to the care, reëducation and return to civil life of disabled sailors and soldiers. It is to be issued periodically under the auspices of the War Office, the Pensions Ministry, and the Red Cross, and Order of St. John of Jerusalem Joint War Committee. The appeal of the journal is to those who are actively engaged in the administration of hospitals and in the conduct of local pension committees and technical institutes, and, with this object in view, each number will contain an article or articles on the treatment of some particular kind of disablement. The first article in the current number is by Sir Alfred Keogh, G.C.B., on treatment of the disabled, and is a memorandum prepared by him for the Anglo-Belgian Committee. It refers to pension arrangements, modern curative workshops, after-care of the blind, the problem of the deaf, and the provision of artificial limbs. Captain Basil Williams contributes a very full and authoritative article on pensions, in which, after a short historical summary, he gives details of the arrangements now brought into force. The Intelligence Department of the local Government Board has a report on work for disabled men in France and Germany. There is a paper by Sir Robert Jones, C.B., on "Orthopedic Surgery in Its Relation to the War." Throughout the volume are photographs of work being done by crippled soldiers at the Military Orthopedic Hospital at Shepherd's Bush. The second number will contain reports on the recent International Conference on Disablement, in Paris.

The usefulness of such a journal can be measured only by the great and pressing need of the numbers of partly disabled soldiers and sailors, who must be provided with adequate training and facilities to enable them to return to civil life and lead normal and healthy existences.

MEDICAL NOTES.

National Board of Medical Examiners.—The National Board of Medical Examiners held its second examination in Washington, D. C., June 13 to 21. There were twenty-four qualified candidates, twelve of whom appeared for examination, the others having been ordered into active duty between the time of their application and the date of the examination. Of the twelve who took the examination, nine passed.

The next examination will be held in Chicago, October 10 to 18. The regular Corps of the Army and Navy may be entered by successful candidates, without further professional examination, providing they meet the adaptability and physical requirements. There will also be an examination in New York City in the early part of December.

WAR NOTES.

War Relief Funds.—On Aug. 4 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$244,598.00
Armenian Fund	211,615.89
Serbian Fund	123,121.90
Surgical Dressings Fund	114,489.01
Italian Fund	43,454.72
War Dogs' Fund	982.75

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending July 28, 1917, the number of deaths reported was 188, against 169 for the same period last year, with a rate of 12.69, against 9.47 last year.

There were 28 deaths under one year of age, against 25 last year.

The number of cases of principal reportable diseases were: diphtheria, 49; scarlet fever, 12; measles, 52; whooping cough, 39; typhoid fever, 6; tuberculosis, 58.

Included in the above were the following cases of non-residents: diphtheria, 3; scarlet fever, 2; measles, 1; typhoid fever, 1; tuberculosis, 7.

The number of deaths from these diseases were: diphtheria, 4; scarlet fever, 1; measles, 2; tuberculosis, 16.

Included in the above were the following non-resident deaths: tuberculosis, 2.

The Massachusetts Medical Society.

NOTES MADE OF THE QUESTIONS ASKED AT THE CONFERENCE OF THE SPECIAL COMMITTEE ON SOCIAL INSURANCE AT THE STATE HOUSE, JULY 25, 1917.

Printed to show the temper of the committee and the sort of questions that are asked members of the profession when they appear before a committee of the General Court.

A. K. Stone, *Chairman of Special Committee of Mass. Med. Society on Health Insurance.*

The following are the more important questions asked of Dr. David L. Edsall and Dr. A. K. Stone, many of them having been asked of each. Dr. Edsall left the room before Dr. Stone's interview.

The Chairman introduced Dr. Edsall as:

Dr. Edsall of the Massachusetts General Hospital, whom we have asked to come here and give his views on this problem of health insurance. He was good enough to come, and we shall be glad to hear what he has to say to help us in the solution of this problem.

The following questions were asked in the course of the discussion:

1. I thought the essence of this movement was that those who could not afford to get such care would do so with this legislation.

2. It is simply a question of degree, isn't it, for those who have a little, rather than for those who have nothing and now go to the charitable institutions for care?

3. When it comes to a question of health or life, why shouldn't it be an immaterial question whether a man has ten cents or a million dollars in his pocket, and why doesn't the medical profession dwindle into almost insignificance?

4. You appear as an expert on the proposition of social insurance. Are you here to protect the gate receipts of the medical profession? . . . Do you resent the question as to what you are here for?. . . If it is to protect the gate receipts, I think you are a little ahead of the game.

(The chairman interposed and said the doctor had been invited to come and give his views on the proposition.)

5. Would this tend to throw the practice under this law into the hands, we might say, of inexperienced men who have just graduated, or to the man who has been in practice for 15 or 20 years,—the bright, successful man? Where would you grade these men? How would you handle it so as to be fair toward the successful practitioner, as well as to the man who has just started out? Would it tend to throw it into the hands of those who have just graduated?

6. In my own city, while they didn't want to come out with it, there was quite a fear that it might eliminate them in a certain way, and go to a cheaper line of physicians,—that is, cheaper as to experience; those who had recently graduated would be used, and the others might be shut out.

Dr. Edsall suggested creating a board to include all the reputable physicians in the vicinity; then there would be practically entire freedom of choice.

7. You would make it large enough so the people couldn't criticize it; have enough in it so there would be a choice?

8. Do you believe in social insurance?

9. Do you believe it should be compulsory?

10. Do you believe, as a matter of legislative principle, that as soon as we can get this bill through, which we can do, we should say to a man who is struggling along on $15 a week with ten children, "You shall separate yourself from ten cents every week"? Or should we allow him to go to ——?

11. What do you think of a proposition like this: That it should be compulsory on the part of the state, compulsory on the part of the employer, but optional on the part of the employee?

12. Would you consider that a wise way rather than the compulsory?

13. A man who really wanted the insurance but refused to take it would be just where he is today. The man who really needed it the most wouldn't get it.

14. Would it appeal to the thrifty employee who was hard up financially and against his private benefit association, that while the employer and state shared the burden with him the rate would be lower?

15. Do you know people who would be affected by it?

16. In Germany and England is the rate for insurance pretty high?

17. Would it keep it high although it were compulsory?

18. Do you think this compulsory health insurance is much of an advantage for shiftless men? Is the shiftless man going to the dogs anyway? Isn't it better, rather than to help him in sickness and health, to stimulate him by keeping in the background the prospect of an almshouse in the end?

19. We must work on the proposition that a man is shiftless or he isn't. If he is shiftless, how is this going to be an accurate rendering of the situation? You may keep him in good health, but he may indulge in some other form of extravagance just as hard for his family.

20. (To Dr. E.'s remark that he would be perfectly willing to be compelled to take out insurance). Would you be quite so enthusiastic if your income, instead of being $25,000 a year were only $750 a year? Would you be as broad-minded?

21. Has social insurance really lengthened life in other countries?

22. Is length of life any longer today than it was 50 years ago?

23. How do you account for the fact that with the growth of medical science, we have more mental and nervous disorders today than we ever had before?

24. Are men using their heads more and their bodies less than they were 50 years ago?

25. If this were a compulsory proposition, do you think it would be a good thing to carry it out?

26. You don't think that what employers would oppose and the employees would oppose would stand a very rosy chance of going through the legislature, do you?

27. I would like to ask the doctor if, in favoring the scheme of optional insurance to the employee, it is as a scheme by itself, or as a step toward compulsory insurance?

28. If any system were started, even on a voluntary basis, would it inevitably lead to a compulsory basis?

29. The apparent statistics are that, in Germany, for instance, in 1885, when the compulsory law was started, the days of sickness averaged about 5.9 per year per member, while it has gone up now to something over 9. Do you doubt these facts or figures? Don't you suppose they are accurate?. . . You think these statistics may be all right, but are subject to question?

30. Referred to the tendency to malingering.

31. You spoke of how, if we had a system, the doctors should come into it as a medical profession. How can we find out what is economical and at the same time fair to the medical profession? I don't believe that anybody wants to be unfair to the medical profession, but it looks to me that the chance is good, if men like ourselves should get up a law, that we should be unfair to the public or to the medical profession. We should have to make a guess and would make a botch of the job. How can we get definite suggestions as to what is fair to the medical profession, and what is an economic method of handling the work?

Referred to work in hospitals and dispensaries as being cheaper than sending a man to call on a patient. Of course, if the patient is sick abed, that is another question.

32. I question whether we can get real action out of the medical profession until we have persuaded them that something is going to happen. Certain men to whom I have talked haven't shown any interest. If they get scared a little bit, they will think a little bit, but now they are apparently too busy to think. Would it be fair for us to ask the Massachusetts Medical Society?

33. In your work at the hospital, I suppose you have come in contact with cases where it has been proposed to investigate the poverty of certain cases to see if it might be alleviated.

34. We might get facts from the dispensaries, clinics, and possibly the overseers of the poor.

35. Are you familiar with the recent legislation in California, as to insurance?

36. I would like to ask whether this is a state proposition, or a national proposition? Or whether we have got to take it up in a few states as to its feasibility, and then have the Government take it over?

37. I understand the Medical Society has a stenographer here; if they are involved in such a proceeding as ours, why can't they come here instead of our sending for them?

38. When the tuberculosis hospital was planned at Westfield, do you know whether any physicians appeared and took the ground that such a proceeding might interfere with their practice or their incomes?. . . Do you understand it has interfered with the financial returns of the medical profession?

39. Is it not possible this may cause a stimulus to medicine and prove an advantage to the medical profession, rather than a disadvantage?

40. Do you think if a medical man could be found so ignoble as to take a financial interest in his practice, that he would be justified in appearing before this committee and opposing such legislation, as it would decrease his income?

41. A decrease in the income of the profession might interfere with its proficiency.

42. Do you think length of life has kept step with the advance of medical science? Do you think that if people are living longer today, it is simply because they think they are, or because they really are?

43. Are you familiar with the subject of health insurance? Have you formed a definite opinion as between compulsory and voluntary insurance?

44. Don't you think that a thrifty man with a small income who wants to take care of himself is entitled to a system shared by the Commonwealth? Wouldn't it be a step forward?

45. To a thrifty man with a small income, a lower rate is well worth while. He could get a better rate than he can get out of his private insurance company. (Referred to the fact that the state wasn't in it for the money, whereas the private company is.)

Referred again to the "reason the medical profession is not here is because they have not scented a fear; but if it comes to a question of affecting their incomes, they will look into the matter."

46. Possibly there is not a great deal of revenue from the people with small salaries?

47. Just how can we get a report from the

Massachusetts Medical Society on this question, as to their opinion as to how medical insurance ought to be worked out? We can't make any progress along this line unless we take it in sections. If we have social insurance, what would be the proper machinery? We want to know, if we ask the medical society, how we should take action, and how much action we are likely to get.

48. What middle road are we to take between the health of the community and the incomes of the medical profession? Suppose we find a certain bill is going to increase the health of the community and cut the profession in two: are we to follow the pestle or the crowd? . . . It is pre-eminently a question of the health of the people? (Suggested bounties for physicians.)

49. There is the question of preventive medicine. There has been a great criticism of this recent bill to the effect that it did very little for preventive medicine. My whole idea is that, if we are going to have this health insurance, the first thing is to stop sickness because we want to reduce the cost of the insurance.

I should like to ask just what form of question we should put to the Massachusetts Medical Society in order to get the most comprehensive report; not tying it down to last year's bill, but thinking of next year's bill, and a bill five years from now. We want to create a new foundation and see what we can get; then see if we can get it passed after it is formulated.

50. I would like to ask, as to the operation of the law, as to the grade of physicians, or the character and quality of the physicians in the community,—what base you would start on to carry this law out? Dr. Edsall suggested that we have a panel of physicians in certain communities, and that all reputable physicians join this panel.

. . . I would like to ask whether every man who is registered should be considered one of these, and whether we should put a stipulated price on bills? Those are the things which the medical men feel, and which we should be glad to have them solve. Whether it should be a young graduate or the same price for the experienced men,—a flat rate, such as, mumps, $2.00; typhoid fever, $1.50, or something of that kind; something that wouldn't destroy their business. It would be a great help if they could give us some information along that line. If we could get in touch with the medical men, we could handle the question much more easily.

Isn't it also true that if this health insurance is going to happen and we don't know how to handle it, the medical profession have got to take hold of it? Everybody wants to discount last year's bill: Senator Washburn wants to hang on compulsory insurance to the employee. Somebody else wants to cut it down to a little circle of employees. Everybody says "Crawl before you leap." We might have preventive medicine. The medical end of this, to my mind, if not the most complicated, looks so now.

51. Don't you think the most of the patients of the general majority of physicians are those whose incomes are less than $25 a week?

52. If we are going to have insured medical attendance, wouldn't it be one of the primary things that the state take hold of it?

53. Do you believe that in order to pass this legislation, it would be necessary to recommend far more stringent sanitary conditions in mercantile and industrial establishments?

54. Do you believe a good deal of the lack of health and the unhealthy condition of the workers is due to some of the conditions under which they have to labor?

55. Do you think the average person who would be benefited is the person who is overeating?

56. Don't you think that the average factory conditions are as satisfactory as the average home conditions? Don't you think the workman in the factory is taking as few chances as in his home? That there are more sanitary regulations, better toilet-rooms, etc.?

57. Is the medical profession near enough to normal today to take up the discussion, or are they like so many other people, with their minds on the war and upset by losing so many of their best men, that it is a difficult time?

58. What percentage of the medical profession is engaged in war service?

NOTES FROM THE DISTRICT SOCIETIES.

Worcester.—In response to a petition signed by Dr. A. W. Marsh and nine other Fellows of the Society, the President called a "special meeting of the Society for the purpose of taking action upon the matter of division of fees received from patients of Fellows who have or may hereafter enter the army or navy of the United States, and such other matters as may legally come before the meeting."

The meeting was at G. A. R. Hall, 55 Pearl Street, Worcester, at 4.15 p.m., Wednesday, August 1, 1917.

Ernest L. Hunt, *Secretary.*

RECENT DEATHS.

A. W. Smith, M.D., of Milford, N. H., died at his home in that city on July 22. Dr. Smith was born in Waltham, Mass., in 1853. He was graduated from Dartmouth College and Dartmouth Medical School, and, after a year of study in New York, established himself in practice in Milford in 1878. He served for ten years as town moderator, was for twenty years a member of the school board, and in 1881-1890 was representative in the State Legislature. He had remained a widower since the death of his wife in 1902.

Dr. Frank H. Whitney, a veterinary surgeon of Lexington, Mass., was instantly killed, on July 30, by being run over by a train. He was sixty years of age.

The Boston Medical and Surgical Journal

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Industrial Hygiene.

INDUSTRIAL BENZOL POISONING IN MASSACHUSETTS.

BY THOMAS F. HARRINGTON, M.D., BOSTON,
Medical Deputy Commissioner of Labor.

BENZOL, or benzene, is used extensively in the industries of this State, and has given rise to much ill health and has caused several deaths. It is an unstable, very volatile, colorless fluid with a heavy aromatic odor. It is a derivative of coal tar distillation, and is frequently confounded in literature with *benzine*, a petroleum derivative with which it has many properties and uses in common. Benzol is decidedly more poisonous than benzine.

It contains many poisonous substances, such as hydrogen sulphide, toluene, and bisulphide of carbon (50 per cent., often). Much of the toxic effects noted is due to these substances. Poisoning by benzol depends upon individual susceptibility and immunity (natural or acquired), as well as upon the quantity and proportion of impurities in the fumes inhaled.

The principal uses of benzol (benzene) are: Manufacture of colors and dyes; carborizing motor gas and illuminating gas; refining and dissolving fat and grease; lacquer (acid proof) colors and varnish work; rubber industry; as a cement in auto tire-building; in anti-rust, anticorrosive and rapid drying paints. It is also used in the manufacture of pharmaceutical preparations, *e. g.*, aspirin, antipyrine, etc., as well as in the preparation of perfumery scents. Lately, benzol has been extensively used as a substitute for benzine and oil of turpentine, because of its great power in dissolving resin.

Benzol, like its homologues and other hydrocarbons of coal tar, has a specific affinity for the central nervous system and a general action on the protoplasm of the organic cell. The remarkable property possessed by benzol of reducing the number of leucocytes in the blood has given to it a place in medicine in the treatment of myelogenous leukemia. Female workers, particularly at the age of puberty and at the menstrual period, are especially susceptible to benzol poisoning. Symptoms of benzol poisoning vary much with the mode of poisoning; *i. e.*, whether in the form of vapor through the respiratory organs, or by absorption through the skin, or through the digestive tract.

The following cases reported to the State Board of Labor and Industries are typical of the symptoms and result of benzol toxemia.

ACUTE BENZOL POISONING

Two steamfitters were employed in repairing pipes inside a benzol still that had been drawn off three days previously. These men worked together inside the still. This retort was 5 ft.x8 ft. and was entered by a manhole opening 11 in.x15 in. A stream of compressed air under sixty pounds' pressure was fed into the still by a 2 in. pipe while the men were engaged at this work.

One workman, 35 years of age, entered the still about 11 a. m. and worked until 12 noon. He and another workman, 23 years of age, entered the still at 12:30 p. m. At 1:15 p .m. the older man became greatly excited, laughing, singing, gesticulating and acting "as if he had gone crazy." He soon became unconscious and was lifted through the manhole by his fellow worker. It required twenty minutes to get his body through the opening of the retort. It was then discovered that the younger man was unconscious on the floor of the still. He was removed and all efforts to resuscitate him failed. No autopsy was held.

The older man was resuscitated by artificial respiration, oxygen inhalation, lung motor and stimulants. Several days later he was able to report for work.

ACUTE NITRO-BENZOL POISONING.

A man, sixty-five years of age, employed as a teamster for a soap factory, on July 7, 1916, while delivering a five-gallon flask of oil of mirbane (nitro-benzol) accidentally loosened the cork of the flask, spilling the chemical onto his clothes. A fellow workman noticed a pale, sick appearance and before he could reach the teamster he had grown dizzy, nauseated, cyanotic about the lips, mentally confused and was soon unconscious. Artificial respiration failed to resuscitate him and he was taken to the hospital. He soon developed Cheyne-Stokes respiration, slow, weak pulse, blood pressure 90 systolic, 50 diastolic. Blood showed methaemoglobin; later convulsion and coma developed, followed by death three and one-half hours after the accident. Autopsy findings: Poisoning by nitro-benzol.

CHRONIC BENZOL POISONING.

In view of the little information available on this subject in textbooks, the five chronic cases of benzol poisoning (three fatal) reported in Massachusetts are given in detail. All of these cases occurred in the auto tire-building department of a rubber establishment in which benzol cement was used. The process was essentially as follows: The benzol was poured from a can which was rigged with a ball-cock arrangement and a trigger handle so that it was necessary to pull the trigger in order to get a flow of benzol from the can. The benzol was poured onto a cloth and wiped around the tire, preparatory to vulcanizing. This process was repeated about every half hour, or approximately eighteen times in an eight-hour day.

1. (Fatal) A man, 33 years of age, had been employed in the rubber industry since 1907. On April 20, 1915, he was transferred to the tire-building department. He soon complained of severe headaches, often lasting two or three days at a time. In March, 1916, he noticed that he was spitting blood, especially after brushing his teeth. This condition of spongy, bleeding gums was noticed almost daily, and later in March he noticed bluish green spots on his left thigh, followed in a few days by similar spots on his left arm. Soon similar spots appeared in rapid succession on various parts of the body. On May 3rd he gave up work on account of extreme weakness and dyspnoea on slight exertion. On this date he had a severe nose bleed, followed by a similar attack on May 7th, when he was admitted to the hospital.*

Physical examination showed spongy, bleeding gums, pale mucous membrane of throat and conjunctiva, ulceration in posterior nares. Spleen not palpable. Knee jerks present and equal. No Babinski, no ankle clonus. Eyes react to light and to distance, no nystagmus. Breath, foul odor. Free bleeding from right nostril. Speculum examination showed bleeding point on septum about ¾ inch back and near floor of nares. Patient conscious, slight tremor of head, no glandular enlargements, lungs normal, heart sounds weak, regular, no murmur, spleen not felt, liver 2 cm. below costal margin, no masses in abdomen, no spasm, no tenderness. Ecchymotic spots on skin, most marked on outer side of left arm near shoulder and on outer side of each leg. Family history and personal history good. No purpura nor haemophilia in family. Pulse 124, weak. Vertigo and visual disturbance.

Haemoglobin	60%
Leukocyte count	5,000
Red count	2,288,000

Transfusion of ten ounces of blood, followed by uncontrollable epistaxis. Nose-bleeds daily, severe and uncontrollable. Gums spongy and bleed on least irritation. Headache, vertigo, dizziness, restlessness, delirium, talkative, loss of power of arms and legs, coma, convulsions and death on May 18th. Autopsy diagnosis: Benzol poisoning.

Blood Record.

	May 7	May 11	May 12	May 14	May 16
Haemoglobin	60%	45%	40%	40%	35%
Leukocyte count	5,000		1,810	1,100	850
Red count	2,288,000		2,184,000	2,720,000	1,616,000
Polymorphonuclears	....	29	....	....	14
Large Mononuclears	....	14	....	....	20
Small Mononuclears	....	53	....	....	62
Eosinophiles	....	2	....	....	2
Myelocytes	....	2	....	....	2
Platelets	....	Dimin.	....	....	Much dimin.
Achromia	....	Slight	....	....	Slight
Poikilocytosis	....	Slight	....	....	Slight
Megaloblasts	....	Few	....	....	Few

2. (Fatal) A man, 40 years of age, had worked in a rubber factory since 1905. On May 21, 1915, was transferred to the tire-building department. In winter of 1915, noticed much loss of muscular power. Easily fatigued, dyspnoea on least exertion. He was not able to work continuously, was losing in weight, had repeated attacks of headache. In March, 1916, began to have bloody stools. April 1st, noticed tendency to have nose bleeds and a constant cold in the head. About May 1st, had the first severe nose bleed that he had difficulty in controlling. Gave up work on account of loss of muscular power, dizziness and shortness of breath.

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* [illegible] Hospital, Boston.

Entered hospital May 3rd on account of severe nose-bleed.

Physical examination: Well developed and nourished, skin sallow, anemic mucous membrane, ulceration and bleeding spot in nose. Gums spongy, marked ecchymotic areas over lower and upper extremities, some areas being so large as to suggest trauma. No rigidity of neck, no glandular enlargement; lungs, heart and abdomen negative. No nystagmus nor strabismus, disc lemon color, teeth in poor condition, gums spongy, with blood oozing at junction of gums and teeth. Knee jerk present and equal on both sides. No ankle clonus, Babinski nor Oppenheim. No disturbance of sensation. Pulse 120; palpitation, vertigo, haemoglobin 65%; leukocyte count 10,000; red count 3,400,000; blood pressure 120 mg.

Patient failed steadily. Nose-bleeds frequent and more severe. Twitching of limbs and head. Paralysis, delirium, Cheyne-Stokes breathing, involuntary movements of bowels, coma. Death May 20th. Autopsy diagnosis: Poisoning by benzol.

BLOOD RECORD.

	MAY 3	MAY 10	MAY 12	MAY 13	MAY 16
Haemoglobin	65%	45%	45%	45%	40%
Leukocyte count	10,000	4,800	2,300	800	750
Red count	3,400,000	1,872,000	1,632,000	1,552,000	1,742,000
Polymorphonuclears	....	38	....	....	27
Large mononuclears	....	10	....	....	13
Small mononuclears	....	48	....	....	54
Eosinophiles	....	3	....	....	5
Mast cells	....	1	....	....	1

3. (Fatal) A man, 30 years of age, had worked in a rubber factory about two years (since 1914) in tire-building department. No history of nose-bleed, purpura, no hemophilia, either individual or family. Late in 1915, noticed some "red spots" on face and neck. These persisted for about three weeks. During the spring, 1916, noticed that he was much weaker and not able to do his work so well as formerly. Had headaches and dizzy spells. On May 6, 1916, consulted a physician who reported symptoms as follows: Pallor, general weakness, loss of weight, dyspnea, pulse 100-110, palpitation, weakness of gait, headache, dizziness, tinnitus, low white and red count, dry cough. Man returned to work but had to quit again on May 27th. Returned to work again on June 12th.

On July 6th had nose-bleed from left nostril, lasting six hours. The symptoms increased in severity: Pallor, muscular weakness, loss of weight, dyspnea, weakness of gait, tinnitus and nose-bleed. Brought to hospital on July 20th on account of severe uncontrollable bleeding from left nostril.

Physical examination: Pale, anemic, mucous membrane pale. Patient conscious, pupils equal, mouth and teeth in good condition. Gums bleeding, lungs normal, heart rapid, pulse regular, systolic murmur at apex, spleen not palpable, liver 1 cm. below costal margin, no spasm, no tumor, no tenderness. Brownish-yellow stains and evidence of ecchymotic areas on anterior surface of both thighs; knee jerks lively, equal on both sides. Patient grew worse daily and on July 30th developed lobar pneumonia with edema of lungs. Died August 2nd. Autopsy diagnosis: Acute lobar pneumonia, edema of lungs, anemia, exhaustion, consequent on poisoning by benzol.

BLOOD RECORD.

	JULY 20	JULY 23	JULY 26	JULY 28	JULY 30
Haemoglobin	40%	40%	30%	35%	30%
Leukocyte count	2,000	2,100	2,200	1,840	1,600
Red count	2,136,000	2,048,000	1,364,000	960,000	944,000
Polymorphonuclears	29	....	30	....	....
Large mononuclears	7	....	13	....	....
Small mononuclears	62	....	55	....	....
Eosinophiles	2	....	1	....	....
Masts	Few	....	1	....	....
Platelets	Dimin.	....	....	....	....
Achromia	Mod.	....	....	....	....
Poikilocytosis	Mod.	....	....	....	....
Coagulation time	....	18	....	....	....

4. (Non-Fatal) Man, 20 years old, employed in a rubber factory since February, 1915. His duties consisted in receiving tires after they had been cured and apply to them a benzol cement. In March, 1916, he manifested symptoms of benzol poisoning, and in May reported to the hospital for asymmetry of face which he ascribed to the extraction of a tooth. Blood examination showed a haemoglobin of 75%, leukocyte count of 6000, red count 4,480,000. He had headache, nausea, general weakness.

5. (Non-Fatal) Man, 29 years old, employed for more than two years in automobile tire building in which he wiped benzol to the fabric. For past three months has had a papular eruption size of pin head on extensor and flexor surfaces of arms, feet, ears and neck. Later this eruption developed into blebs. Very itchy and accompanied by fever. Stated that 16 or 18 men among the 120 employed in that department had similar eruption. Disappear on substituting naphtha for benzol.

A chemical examination of the benzol used by these men showed it to be free from impurities and of the pure benzol grade. In one of the cases the presence of arseniuretted hydrogen in large quantities in the urine raised a doubt as to possible arsenic poisoning. This was traced, however, to treatment by Fowler's Solution that the man was taking for anemia. The use of the benzol as a cement at the factory, in the tire-building process, was discontinued and naphtha substituted. No further cases of benzol poisoning have been reported to the State Board of Labor and Industries since this change.

Original Articles

ESSENTIAL SHRINKING OF THE CONJUNCTIVA OCCURRING IN ACUTE AND CHRONIC PEMPHIGUS, WITH A REPORT OF TWO CASES.

By Frank A. Conlon, M.D., Lawrence, Mass.

Essential shrinking of the conjunctiva is simply a descriptive name of the end-result of pemphigus of the conjunctiva, although some men,[1] failing at the time of their examination to find specific evidence of a general pemphigus, have considered it a separate and distinct disease.

After a careful review of the literature, I find that all of these cases, so considered, come under Thost's[2] classification of chronic pemphigus of the mucous membrane, of which he gives the following characteristics:

1. Affection exclusively of the mucous membrane.
2. Unusual participation of the ocular mucous membrane, which tends to form synechiae.
3. Tendency to adhesion of all mucous surfaces.
4. Chronic evolution without fever.
5. Treatment of no avail.
6. Cachexia and dystrophy, cutaneous and muscular.

The lesions in the mouth or nose may easily be overlooked, as my patient told me her eyes troubled her so much that she had entirely forgotten about the condition in her mouth.

Pemphigus of the conjunctiva was first described by White Cooper[3] in 1858. It was described as syndesmitis degeneration by Stellwag[4] in 1870, and as essential shrinking of the conjunctiva by Kries, in 1878, of von Graefe's clinic. Von Graefe, in 1879, propounded the identity of pemphigus and essential shrinking of the conjunctiva.

It is a very rare disease. Adam[5] saw one case in eleven thousand ophthalmic cases; Franke,[6] five cases in forty five thousand; Pergens,[7] two in twenty-two thousand, while the late Herman Knapp[8] saw but one case in his long experience. It occurs with equal frequency in both sexes and at all ages; Alt[9] reporting one in a girl of four and Banysiekiews[10] in a woman of seventy-six.

Etiology. In the majority of cases there is no predisposing condition or cause, yet in a few a septic[22] wound or vaccination[23] has been given as its origin.

A specific organism has been found in the bullae by the following writers: Cirincione,[11] Demme,[12] Dahnhardt,[13] and Blutrau.[14] They describe it as a diplococcus, rather larger than the gonococcus, which forms round, white colonies on agar, grows rapidly on bouillon at 37; well on agar and serum. The cocci stain with aniline dyes and by Gram's.

The cocci are not present in the sac after cicatrization is complete, and do not cause shrinking when placed in the conjunctival sac of animals, but do cause a rather severe conjunctivitis. Demme found the diplococcus in the blood. Xerosis bacilli in large numbers have been frequently demonstrated, but this, undoubtedly, has been due to the favorable soil found in the degenerate corneal epithelium. By some the condition is regarded as due to the action of toxins upon the nerve centers, resembling herpes in this respect.

Case 1. Mrs. G., fifty years old. Pemphigus lesions first observed in the mouth along the first of August, 1915. Patient seen December 20, 1915, at which time she presented large bullae all over her body, with involvement of both eyes. The right eye presented an elevated, sharply defined spot five millimeters from the corneal sclerae on the nasal side about three millimeters in diameter. There was a loss of epithelium in the center, evidently a ruptured vesicle. Another similar spot was seen on the ball on the temporal side. The left eye showed two spots on the bulbar conjunctiva in corresponding positions and of identical appearance. Patient said her first eye trouble occurred one month before and lasted a week, and that the present lesions appeared that morning. Palpable conjunctiva was slightly injected and there was a beginning obliteration of the lower culs-de-sac. This seems a remarkably short time for a noticeable shrinking to develop, yet Stieren[15] saw an almost complete obliteration of the conjunctival sac develop in six weeks.

Case 2. Mrs. K., 50 years old, American born; while never a robust woman, she always enjoyed good health. I first saw this patient May 15, 1915, when she complained of an irritation due to entropion of her left lower lid. My records showed at that time twenty twentieths vision in each eye, both corneae normal, slight redness of the bulbar conjunctiva of the left eye. The lower conjunctival sacs of both eyes were from three to four millimeters in depth, with numerous vertical folds of glistening white conjunctiva. At this time there was no appreciable involvement in the upper fornix of either eye. In June, 1916, she developed an erosion covering the lower half of the left cornea (ruptured bulla) with an iritis. Within a month, there was a complete obliteration of the lower cul-de-sac. The condition of her right eye remained unchanged from the time of the first examination, in May, 1915, until December, 1916, when there was a rapid obliteration of the lower cul-de-sac, which became complete in February, 1917. At the present time the patient can open her eyes but two or three millimeters. Both lower lids are attached, their full length, to the eyeball and lower part of cornea. The cornea of the left eye is obscured by a dirty-white exudate or membrane, which can be removed with difficulty, showing a diffuse infiltrate of the cornea proper covered with dull, dry xerotic epithelium. In the inner canthus the edges of the lids have grown together for about six millimeters; this condition exists in the outer canthus also, but not to such a degree. This ankyloblepharon has developed very rapidly during the past month, and if it continues its present progress, the eye will be completely closed in a very short time. The right eye is very similar in appearance to the left eye, except that the cornea is still normal. The same dry white exudate is just appearing in this eye, which greatly interferes with what little vision the patient now retains.

I know of no better description of the appearance of these eyes than that given by White Cooper, in 1858, when he said, "one would have pronounced that some powerful escharotic, such as lime, had been applied to them." This patient at first denied having any trouble with her mouth or nose, but on close questioning she remembered being treated, by a dentist, for blisters in her mouth in the summer of 1914. The dentist informs me that he treated her for a peculiar condition of her gums, which was characterized by the peeling off of rather large areas of mucous membrane, which left a bleeding surface underneath. Local treatment had no effect upon the condition. The patient says that she feels a blister in her mouth, which breaks in three or four minutes, leaving a sore spot which causes considerable pain, from three to five days, while eating. The short period before rupturing, as compared to those on the skin, is due to the much more delicate epithelium, and explains why we practically never see bullae in cases of chronic pemphigus of the mucous membrane. This patient is now able to open her mouth but about half way, owing to the cicatrization of her buccal mucous membrane. Trautman[24] saw a patient whose mouth was completely closed for eighteen years, due to the extensive cicatrization characterizing this disease. The left side of the roof of her mouth is covered with dense scar tissue. Erosions and scar tissue cover both sides of the septum. The naso-pharynx and larynx show no signs of involvement. There have never been any lesions on the skin.

Pathology. From the appearance of symblepharon one would naturally suppose the process was the growing together of two denuded surfaces, but a careful microscopic examination shows that this is not the case. A very complete pathological report was published by Adam[5] and another one by von Marenholtz.[16] Adam says, "The essential process of pemphigus of the eye is not the formation of bullae, with consequent healing, but is an inflammation of the sub-epithelial and adenoid layer of the conjunctiva going over into cicatrization. The shrinking of the conjunctival sac is not due to a sticking and growing together of the conjunctiva, but to a cicatrization of each spot of inflammation. The result is a formation of vertical folds which appear like adhesions. He found in his corneal section that the process consisted of a denudation of epithelium, followed by an irregular regeneration of exuberant granulation." Von Marenholtz found the cornea covered by epithelium from the lids.

Treatment. The treatment is very unsatisfactory. Thiersch grafts have been done by some,[8, 17] with good surgical results, but the degenerative changes in the cornea have nullified their efforts.

Ogue and Imai report disappointing results with treatment by x-ray and radium. Bordley[18] used a vaccine made by the anaerobic method of Noguchi and Flexner, and saw a temporary improvement, while Bishop Harmon[19] used vaccine with absolutely no results. Bane reports a retardation of the disease by treatment of the x-ray, but I think his case may have been one which was treated in the quiescent stage. In my case there is no change in the right eye in eighteen months, and in Burk's[21] there was none in twenty years, so one must be careful and not ascribe to the treatment that which may be the untreated course of the disease. I have used thiosinamin and the improved product, fibrolysin, without noting any improvement whatsoever. Fibrolysin was used by von Marenholtz for four months with slight improvement. Arsenic is given, as a rule, with vain hope that it may do good. Pemphigus of the conjunctiva may result in blindness in four to six weeks, or a patient may suffer from the disease twenty or thirty years without corneal involvement and its consequent loss of vision. Up to date we are helpless and unable in the slightest degree to influence the progress of the disease.

REFERENCES.

[1] Cohen, Martin: Arch. of Ophth., p. 65, Vol. xlvi.
[2] Thost: Monatschrift. f. Ohrenheilkunde, p. 165, 1896.
[3] Cooper, White: Royal London Ophth. Hospital Reports, p. 155, Vol. i, 1858.
[4] Parsons, J. H.: Pathology of the Eye, 1904, p. 91.
[5] Adam, C.: Zeit. f. Augenheilk., p. 35, Vol. xxii.
[6] Franke: Der Pemphigus und die essentielle Schrumpfung des Bindehautsacken, 1900.
[7] Pergens: Pemphigus des Auges, 1900.
[8] Marple, W. B.: New York Eye and Ear Reports, 1900.
[9] Alt's Klin.: Darstellung der Krankheiten des Auges, p. 84, 1881.
[10] Banysiekiews: Zeh. Klin. Monat. Augenheil., p. 326, Vol. xvii.
[11] Cirincione: La Clinica Oculestica, p. 281, Vol. xv, 1915.
[12] Demme: Verhandl. des Cong. f. Inn. Med., Wiesbaden, 1886, p. 336.
[13] Dahnhardt: Deutsch. Med Wochensch., p. 711, Vol. [illegible], 1887.
[14] Blutrau: Berlin. Klin. Wochensch., p. 671, Vol. xxx.
[15] Stieren: Transactions American Ophth. Society, p. [illegible], Vol. xiv.
[16] von Marenholtz: Zeit. f. Augenh., 550, Vol. xxvii.
[17] Ogue and Imai: Nippon Gank. Zishi, Nov., 1913.
[18] Bordley, J.: Ophth. Rec., p. 545, Vol. xxv.
[19] Harmon, Bishop: Proc. Roy. Soc. Med., Ophthal., p. 19.
[20] Bane: Ophth. Rec., p. 32, Vol. xx.
[21] Burk: Klin. Monat. f. Augenh., p. 761, Vol. xi.
[22] Pernet and Bulloch: Brit. Jour. Derm., 1896, pp. 157-205.
[23] Tulley: Jour. American Med. Assn., Vol. ix, p. [illegible].
[24] Trautman: Zur differential Diagnose von Dermatosen und Lues, 1903.

INTESTINAL ADHESIONS AND PERITONEAL BANDS IN EPILEPTICS.*

By Heiman Caro, M.D., Palmer, Mass.,
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So much emphasis has been placed upon the abnormalities of the gastrointestinal tract, and the relation of the superimposed condition of chronic intestinal stasis to the convulsive seizures, that at times it has almost appeared necessary to assume that every constipated individual was a potential epileptic. But the fact remains that most constipated individuals are not. There is, without doubt, one type of epilepsy where a definite relationship between intestinal conditions and the seizures does exist, but it includes only a small percentage of those suffering from this group of diseases. The purpose of this paper is, first, a consideration of the causes of chronic intestinal stasis; second, the etiologic factors present in the causation of intestinal adhesions and abnormal peritoneal bands; and, third, inasmuch as these bands and adhesions give some evidence of the presence of colonic stasis, a comparison of the incidence of this pathologic condition as found in the necropsy protocols of an institution for epileptics and in those of a general hospital.

The abnormalities of the intestinal tract may manifest themselves clinically by varying degrees of chronic intestinal stasis. It is possible that derangements of the metabolism of the endocrine glands may play a part in the causation of this condition in those epileptics in whom intestinal stasis is a prominent symptom.[1] But the more usual causes of chronic intestinal stasis are frequently found present in epileptics. The sedentary conditions under which, of necessity, many of those suffering from this group of diseases must live, combined with general mental apathy, due to the disease itself or to bromism, may produce the condition in some. Restricted diets, lessened water intake, gluttony, lack of habit formation, flabby abdominal musculature, and overpowering inhibitory influences surely play their part.

Increasing resistance to the passage of the fecal current may be due to enteroptoses, angulations, fibrous bands and adhesions, strictures of the lumen of the gut, movable cecum, and the like. But while developmental and congenital anomalies are at the bottom of many cases of constipation,[2] yet roentgen ray examinations have shown that such mechanical obstacles do not, necessarily, entail a condition of stasis. Indeed, passage through the large intestine may occur quite normally in spite of them.[3] With the possible exception of colonic atony or colonic tetany due to disturbances of innervation of the intestines, the chronic intestinal stasis of epileptics depends upon the same causative factors as found in every constipated individual.

Intestinal bands and adhesions have been selected for this study, for the reason that they are not affected by post-mortem changes, and, in consequence, assuming that the error of omission is a constant, the conclusions drawn from their incidence are less open to criticism. There are three important factors in the causation of intestinal bands and adhesions, namely, (1) defects in embryonic development, (2) acute inflammations of the peritoneal surfaces, and (3) mechanical causes.

Congenital anomalies are by no means frequent. Under this heading may be mentioned the peritoneal bands and web-like processes which, arising in the vicinity of the gall-bladder, extend across to the pylorus, duodenum, hepatic flexure, and transverse colon. These are probably remnants of the anterior mesentery. I have found such processes in eight necropsies upon epileptics. They may not give rise to symptoms, but Homans, in a clinical study of eleven cases, mentions constipation as being present in two. One of these, at operation, showed a firm band of peritoneum stretching across the hepatic flexure.[4]

The acute inflammatory factors giving rise to adhesions included such conditions as tuberculosis, peritonitis, gall-bladder disease, appendicitis and its complications, inflammations of the female adnexa, and other acute abdominal states. The *modus operandi* of these lesions is well known. In this connection it may be well to suggest that adhesions about the appendix may be due to mechanical causes as well as to acute infections.

The mechanical factors are at work chiefly in the region of the colon, and resulting from stasis serve to accentuate any intestinal abnormality that may be present.[5] It has been suggested that the sequence of events in the formation of pericolonic membranes is first a condition of colonic stasis from any of the causes, or combinations of them, mentioned above. Then colonic dilatation with increasing stasis occurs, until finally bacterial invasion and toxin osmosis into the pericolonic tissues causes the formation of anchoring bands or diffuse membranes. It is of interest that Turck has shown that the intestinal wall is permeable to the intestinal flora, and that histological changes occur in the cells, through which the bacteria may have migrated.[6]

In a recent investigation I came to the conclusion that peritoneal bands and intestinal adhesions played but a small part in the causation of colonic stasis, but stated that their presence was an indication that, in at least some degree, this condition had been present.[7] From the standpoint of pathological material they may well serve as a method of comparing intestinal abnormalities and symptoms among epileptics and normal individuals. It is hardly to be denied that functional tests as shown by roentgenographic work is a far more desirable index to base conclusions upon, but at present such comparisons are hardly feasible.

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* Read before the National Association for the Study of Epilepsy, May 29, 1917.

I have reviewed the protocols of 280 necropsies on epileptics recorded at the Monson State Hospital from 1900 to the present time. Acute abdominal conditions and adhesions complicated by carcinoma have been omitted from the tabulation. In this series, intestinal adhesions and peritoneal bands were mentioned in 50 necropsies (17.85%). Peritoneal bands were found originating in the region of the gall-bladder and extending across to the hepatic flexure and transverse colon in eight cases. In five only the duodenum and pylorus were involved by such bands. In none of these was there any evidence of gall-bladder disease, gastric or duodenal ulcer. Extensive adhesions due to cholecystitis were found in two cases. Adhesions between the coils of the small intestine were present in eight, and in only one of these was there any apparent connection with inflammation in the right inguinal region.

Turning to the region of the large intestine, adhesions of varying degrees about the appendix were found in fourteen protocols. In three more both cecum and appendix were involved. In two cases there were firm bands about the cecum alone, one being due to an appendectomy. The ascending colon was found to be firmly bound down once, while the descending colon was similarly affected twice. Four protocols described bands causing displacement of the splenic flexure. The last necropsy of this series was complicated by umbilical hernia. The adhesions found present were due to this, but the epilepsy had been definitely established before the appearance of the hernia. It will be noted that in thirty-eight of these protocols, the adhesions and bands mentioned were about the large intestine, especially in the region of the cecum and ascending portion. It is in the large gut that stasis would naturally occur.

Table I.—Site of Adhesions in 280 Necropsies on Epileptics.

Gall-bladder to duodenum and pylorus	5
Due to cholecystitis	2
Small intestines	7
Small intestines plus cecal adhesions	1
Appendix	14
Appendix and cecum	3
Cecum	2
Ascending colon	1
Gall-bladder to hepatic flexure and transverse colon	8
Splenic flexure	4
Descending colon	2
Due to hernia	1
Total	50

But does the above incidence of adhesions among epileptics differ at all from that of non-epileptics? For this purpose, through the courtesy of Dr. Frank B. Mallory, of the Boston City Hospital, I investigated some 775 necropsy protocols contained in the records of the pathological laboratory of that institution for the years 1900-1-2-3-10. Omitting acute abdominal disease, as well as carcinoma, I found mention made of bands and adhesions in 142 protocols (18.3%).

Turning first to the region of the gall-bladder, this viscus was bound down to the duodenum and pylorus in four cases. In twenty-three more, peritoneal bands and adhesions stretched from the inferior surface of the liver across to the transverse colon and hepatic flexure; one of these had, furthermore, firm adhesions about the splenic flexure, while three were complicated by gall-bladder disease. In seventeen protocols, adhesions between the coils of the small intestines were mentioned, and in only three was there definite evidence of inflammation about the appendix, thus indicating an earlier acute peritonitis. Varying degrees of tying down of the appendix were found in forty-four cases, while in fifteen more the adhesions involved the cecum as well. One of the latter showed an abnormal band of peritoneum stretching across the splenic flexure. The cecum alone was found involved in nine cases. The ascending colon was firmly tied down in two. Bands about the hepatic flexure were described in five, while the splenic flexure was similarly involved in three. The descending colon was buried in pericolonic membranes in three cases, while there were bands and adhesions of varying degree about the sigmoid in seven. Of the remaining protocols, adhesions in four were due to hernia, and in six to operative procedures within a year preceding time of death. It will be noted here also that the site of predilection for adhesions and bands appears to be in the vicinity of the large intestine. From a total of 142 protocols, over two-thirds showed bands in this region.

Table II.—Site of Adhesions in 775 Necropsies at a General Hospital.

Gall-bladder to duodenum and pylorus	4
Due to cholecystitis	3
Small intestines	14
Small intestines plus appendiceal bands	3
Appendix	44
Appendix and cecum	15
Cecum	9
Ascending colon	2
Gall-bladder to hepatic flexure and transverse colon	20
Hepatic flexure	5
Splenic flexure	3
Descending colon	3
Sigmoid	7
Due to hernia	4
Operations within a year	6
Total	142

To recapitulate briefly, it has been shown that in a review of 775 necropsy protocols of patients in a general hospital the incidence of intestinal adhesions and peritoneal bands was found to be relatively the same as in a series of 280 necropsies upon epileptics. Considering each portion of the intestinal tract separately, it will be noted that this general statement holds true throughout. The favorite site of these adhesions is about the large intestine, thereby favoring the presence of colonic stasis.

CONCLUSIONS.

1. In view of our present knowledge, the constipation of epileptics cannot be said to be due to factors differing far from those usually considered in the colonic stasis of other patients.
2. Intestinal adhesions and peritoneal bands are due to congenital defects, acute inflammatory processes, or mechanical causes.
3. Such processes are no more frequent in epileptics than in non-epileptics.
4. It seems probable that intestinal anomalies are not present in any greater proportion in epileptics than in other persons, and in the last analysis, we are still combating, from a therapeutic viewpoint, a general condition, and no one particular lesion or pathologic phase of metabolism.

REFERENCES.

[1] Cotton, Corson-White, Stevenson: N. Y. Med. Jour., Vol. civ, No. 12.
[2] Clark, J. G.: Jour. of A. M. A., Vol. lv, p. 449.
[3] Borgbjaerg, A.: Ugeskrift for Laeger, Copenhagen, Vol. lxxix, No. 5.
[4] Homans, J.: Boston Med. and Surg. Jour., Vol. clxxv, No. 19, p. 665.
[5] Jones, G. I.: Am. Jour. of Med. Sci., Vol. cxlix, No. 3 (516), p. 388.
[6] Turck, F. B.: Boston Med. and Surg. Jour., Vol. clxxvi, No. 19, p. 663.
[7] Caro, H.: *Ibid.*, Vol. clxxvi, No 20, p. 697.

A COMPARATIVE STUDY OF FEEBLE-MINDEDNESS AND PSYCHOPATHIC PERSONALITY AMONG OFFENDERS IN COURT.

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In a former paper attention was called to three distinct types of mentality found among border-line mental cases in court: the defective mentality, the psychopathic mentality, and the delinquent mentality as such.

To be sure, there is often an over-lapping in the same individual, but for purposes of practical classification we may regard these three types of mentality as definite entities. Certainly they seem to present very marked individual differences, and create—because of essential constitutional dissimilarities—social problems that require entirely different angles of approach in dealing with them.

The present paper undertakes a comparative study of two of these types—the *feeble minded* and the *psychopaths.*

For the purposes of this study two hundred cases were selected, one hundred from each group. The object of this study was to find out whether the apparent differences existing between these two types of individuals were sufficiently marked to make a separate classification practical.

The cases were taken from the files alphabetically and represented the first one hundred of each group whose clinical histories contained sufficient data to warrant inclusion for study.

As a matter of course, the earliest noticeable deviations were in childhood. Their ability to profit by school instruction sharply divided our two hundred cases into two well-defined groups. On the one hand, we find individuals perfectly capable of profiting by school instruction, advancing from year to year, and, in the majority of instances, graduating from grammar school, many doing well in high school, some graduating and going on to college.

On the other hand, we find a group of individuals, none of whom were able to graduate from grammar school, all of whom evinced an apparent incapacity for profiting by ordinary school instruction, could not measure up to the standards of normal mental development, as required by the public school curriculum, and, in general, were regarded as mental failures. The following table indicates the grade reached upon leaving school.

Grade Reached at School.

		Feeble-minded	Psychopaths
Grammar Grades	Primary	4%	0
	1st Grade	11%	0
	2nd "	4%	0
	3rd "	12%	1%
	4th "	14%	0
	5th "	23%	2%
	6th "	11%	2%
	7th "	9%	4%
	8th "	7%	7%
	9th "	0	9%
		0	38%*
High School	1st year	0	4%
	2nd "	0	8%
	3rd "	0	1%
			6%*
College	Freshman year	0	1%
	Sophomore year	0	1%
	Junior year	0	1%
Data not obtained		3%	13%
No schooling		2%	2%

* Graduated. No other schooling

The feeble-minded collect at the lower end of the scale, while the psychopaths collect at the upper end. A majority of the feeble-minded—68%—never got further than the fifth grade in school, while 82% of the psychopaths got above the fifth grade. 60% of the psychopaths graduated from grammar school, 22% of the psychopaths went to high school, 9% graduated from high, and 3% went to college. Not a single feeble minded individual was ever able to finish grammar school.

This difference in behavior, at the very beginning of their training for life's battles, constitutes the first link in the chain of evidence for differential diagnosis between these two types. One group very early in the race becomes disqualified and drops out. The other group goes on to a more successful accomplishment of required training.

In due course of time our individuals reach that stage of their careers where the sterner problems of self-support are to be reckoned with. Just what individual differences their behavior here exhibited the following table will indicate.

Table of Industrial Efficiency.

	Regularly Employed	Irregularly Employed	Odd Jobs	Work at Home (Women)	Do Not Work at All
Feeble-minded	4%	21%	28%	13%	34%
Psychopaths	28%	41%	4%	17%	10%

Seven times as many psychopaths are steadily employed as feeble-minded. While the feeble-minded in a majority of instances (62%) are either unemployable or simply do odd jobs, the psychopaths in 69% of cases were either steadily or irregularly employed and self-supporting.

The feeble-minded as a class are in the majority of these cases industrially inefficient and not capable of "holding down" positions for any length of time; while the psychopaths as a class are, in the majority of these cases, fairly efficient, industrially, capable of holding positions for much longer periods, and, when they lose such, do so more because of their temperamental peculiarities, their emotional instability, etc., than any real lack of industrial efficiency.

From these two types are drawn a large percentage of repeated offenders. The following table indicates the comparative frequency with which they appear in court.

Table of Arrests.

	Total No. of Arrests	Average Each
Feeble-minded	1825	18.25
Psychopaths	369	3.69

It appears from the above that the feeble-minded are arrested almost five times as frequently as the psychopaths. Now this surely does not mean that the feeble-minded are five times as wicked or as delinquent as the psychopaths. It very probably refers to the fact that, being more stupid, they are more easily caught. Likewise, being economically more unstable, they drift aimlessly, falling into the hands of the court for various minor offenses which the psychopaths, because of their greater intelligence and economic efficiency, are able to avoid. Whatever be the explanation, I present the objective facts for what they are worth.

I shall review two main efforts at treatment tried by the court: *probation* and *penal treatment*. The following table shows the different reactions of these two types to probation:

Table of Probation.

	F. M.	Psycho.	Feeble-minded	Psychopaths
No of times placed on probation			432	161
No. times surrendered	220	50		
No. times inside probation	118	18		
No. times defaulted		14		
No. of unsuccessful probation periods			338	82
No. successful probation periods			94	79
Percentage successful probations			21%	49%

79% of the probation periods of the feeble-minded were unsuccessful, while 51% of the probation periods of the psychopaths were unsuccessful. 21% of the probation periods of the feeble-minded were successful, while more than twice that number (49%) of the probation periods of the psychopaths were successful. The chances are better than two to one in favor of the psychopaths, and this without any special efforts directed towards training them to counteract those difficulties of personality most responsible for their failure. It is quite likely that more can be done for the psychopaths through probation than through any other agency, provided their treatment be guided by a knowledge of their temperamental peculiarities, their personality mal-adjustments, so that their environment can be suitably influenced or chosen for them and they themselves trained to inhibit their impulses.

The feeble-minded are less promising. They suffer from a fundamental defect in their intelligence that renders them incapable of profiting properly by experience and prevents them from measuring up to the accustomed standards of conduct. Only a small percentage—in these cases not more than 25%—could be considered satisfactory probation cases. The larger proportion of the feeble-minded are needing more or less permanent supervision.

The court tried also penal treatment, as the following table will show.

Table of Penal Treatment.

	No. of Sentences	Average Each	Length of Time Sentenced	No. of Indeterminate Sentences
Feeble-minded	735	7.35	106 years	250
Psychopaths	71	.71	12 years	14

40% of the arrests in case of the feeble-minded resulted in a sentence, while only 19% of the arrests in case of the psychopaths resulted in a sentence. Likewise, the length of time sentenced is proportionately much longer for the feeble-minded, though the type of offenses committed remains much the same. A recognition on the part of the judge of a difference in the character of treatment needed for these two types is apparent, though the real explanation may be found in the length of their records and recommendations of the probation officer.

Finally we come to the mentality of these two types. It stands as the most important, the most fundamental factor underlying all the foregoing facts.

TABLE OF MENTAL LEVEL.

	7-8 YRS.	8-9 YRS.	9-10 YRS.	10-11 YRS.	11-12 YRS.	SUB-NORMAL	ADULT
Feeble-minded	4	30	41	25	0	0	0
Psychopaths	0	0	0	1	3	12	84

Here again the feeble-minded collect at the lower end of the scale, while the psychopaths collect at the upper end. 75% of the feeble-minded had a mental level below ten years; none of the psychopaths had so low a level of intelligence. 25% of the feeble-minded were between ten and eleven years; only 1% of the psychopaths had such a low level. None of the feeble-minded were above the eleven-year level; 99% of the psychopaths were above this level.

The fact is that a great majority of the psychopaths (84%) had a perfectly normal intelligence, while all of the feeble-minded suffered from an arrest of mental development prior to reaching adolescence; an obvious defect in their general intelligence, a dwarfing of their mental faculties, that prevented them from ever reaching the adult status of mentality. (To be sure, some of the feeble-minded possess markedly psychopathic traits. They still, however, come under the classification of feeble-minded).

We must think of the psychopaths in an entirely different light. We must consider these individuals in the light of adjustment of their personality, rather than in terms of general intelligence, and realize that their anti-social conduct is due less to their stupidity, less to their lack of understanding the demands of a normal social organization, and inability to foresee the consequence of their acts, than it is to a lack of ability to inhibit impulses, to assume responsibilities, to face difficult situations, to resist discouragements, and to coördinate properly a poorly balanced nervous mechanism. Their mentality is not defective in the usual meaning of the term, but is unstable, impulsive, vehement, in some cases erratic.

They are very emotional, easily upset, lacking in inhibitions, undertake many obligations, never fulfilling any; are restless, at times show great motor activity, become easily fatigued, and, occasionally, are violent and apparently insane under the influence of alcohol, drugs, or excitement. While under detention they clear up and give no evidence of a psychosis or mental defect, only to have another outbreak when things go wrong in their environment. In institutions they give more trouble than any other group, and seem little modified by such treatment. At times they become absolutely unmanageable, and because of the fact that they seem so erratic and uncontrollable, they are often considered insane, and are transferred to insane hospitals.

The fact is, these individuals are better handled outside, except in cases where vicious and markedly delinquent traits render their incarceration necessary. They react to discipline very poorly—one may say violently—but much progress can be made in the way of training them through an intelligent effort to understand their motives and to secure their own coöperation in undertaking to study their weaknesses and to educate their inhibitions; in short, a development of sufficient self-control to counteract their impulsive tendencies.

SUMMARY.

In this study a comparison was made of feeble-mindedness and psychopathic personality under six main headings: grade reached in school, industrial efficiency, number of arrests, probation, penal treatment, and mentality. It appeared that there was a marked difference in the way these two types reacted, the deviation being such as to justify their consideration under separate categories for practical court work.

The feeble-minded could not make the required progress in school. They were incompetent, impotent, and dropped out, unable to finish grammar school. The psychopaths were able to make better progress, in the majority of cases finishing grammar school, many going on to high school, some graduating and going on to college.

Comparing them on the basis of industrial efficiency, it was found that seven times as many psychopaths were steadily employed as feeble-minded. The majority of the feeble-minded were not self-supporting, while the majority of the psychopaths were.

The feeble-minded were arrested about five times as frequently as the psychopaths, though it was explicitly stated that such facts should not be construed as indicating comparative criminality of the two types. It could be interpreted only as indicating that the machinery of the court was being employed more frequently for this group.

On probation the psychopath is twice as good a risk as the feeble-minded. It was thought that in general terms more could be done for the psychopath through probation than through any other method, provided an effort be made to guide his treatment by a knowledge of his peculiar personality.

The attitude of the court was in favor of this, when the feeble-minded received twice as many sentences, in proportion to number of arrests, as the psychopaths.

The most important link in the entire chain was found in the table of mental level. None of the feeble-minded had a mental level above eleven years. All of the psychopaths—with one exception—possessed a level of intelligence above eleven years. The feeble-minded collect around the lower end of the scale of intelligence, while the psychopaths collect around the upper end. We are to think of the feeble-minded in terms of development of general intelligence. A halt in development occurs prior to their reaching adolescence. We are to think of the psychopaths in terms of adjustment of their peculiar personality. Their intelligence itself is not at fault. They are unstable, impulsive, emotional, and poorly balanced. Contrasted with the normal individual, whose mental faculties work in harmony, are correlated and well-balanced, the mental machinery of the psychopath is discordanced, dis-related, and poorly balanced.

In the light of foregoing facts, it would seem safe to conclude that any form of social treatment that does not take into consideration the essential differences in mental make-up existing between these two types must eventually fail in the practical solution of their problems.

HEARING TESTS FROM A PRACTICAL STANDPOINT.*

By George L. Richards, M.D., Fall River.

Hearing tests are as old as modern otology, and have been written about at great length by many authors, both in textbooks and in monographs. They have been so much elaborated and made so complex that the busy man is often tempted to omit or abuse them. I desire in this paper not to discuss these tests in detail, but to suggest a plan that is at once practical and at the same time sufficiently scientific to give satisfactory results. This procedure is neither unduly time-consuming to the physician, nor fatiguing to the patient, both of which are true when a complete functional test by all the well-known methods is made.

Many years of experience have taught me that hearing tests are largely neglected because they take up so much time. We learn with the aid of a single tuning fork and a few simple tests to make a fairly accurate snap diagnosis as to whether we are dealing with a middle or internal ear lesion, without differentiating with great accuracy as to the extent and location of the lesion, and with this are apt to be content.

This would not be so bad were it not that a prognosis based on these tests alone might have been somewhat modified had a more thorough functional examination been made before and after treatment.

The occasional case, where there may be islands or gaps of hearing, and medicolegal or otherwise exceptional cases, may require a complete functional examination with all the means at our command. Whether this will or will not be necessary will be evident to the examiner.

The object of any hearing test is to determine the quantity and quality of the deafness present and the location of such lesions as far as these tests can enlighten us.

The normal range of hearing for the human ear varies from 16 to 32 (seldom below 32) vibrations a second (the so-called lower tone limits), up to 30,000 to 42,000, the upper tone limit. We are taught that in middle-ear deafness there is an impairment in hearing range for the lower tones, while the higher tones are but little or not at all affected, and that in nerve deafness there is impairment of hearing power for the higher tones, while the lower tones are relatively less affected. When both are affected there is a diminution of hearing power for the entire range.

The apparatus required for these tests is a set of the usual C tuning forks, with the addition of C 64, two A forks, a stop watch, with a clear, well-defined click, a Bárány noise machine, an Edelmann-Galton whistle, a long six-foot speaking tube, the observer's voice, and a room with as great a length and with as much freedom from external noises as the examining place affords.

Tuning Forks. The individual set used must be tested out on a number of normal ears, for both air and bone conduction, and these recorded as the fixed fractions for these forks (for they will not give the same results in any two sets); even then there is apt to be a distinct source of error, since the force of the blow on the fork will vary with the habit of the examiner using them; hence it is desirable to have as definite a method of striking these forks as possible in order to get a uniform blow. High forks with hammer attachments are in the market, but it is easier to strike high forks uniformly than it is the low ones.

The low fork should be used by bringing the prongs together with the fingers, then with a sliding motion quickly letting go. This gives a fairly uniform effect; the higher forks can be used in the same way or may be struck on the knee or the heel with a quick but not too strong blow. Writers have had much to say about the elimination of overtones. This is not an easy task, even with weighted forks, nor is it particularly necessary since the overtones disappear before the real tones, so that our measure of value is fairly accurate even in their presence, and I disregard them.

Because of the difference in striking the blow to the fork it is desirable that the same examiner make the individual tests both before and after the treatment. This especially applies to those of us who have assistants or associates. Do not make the test yourself before the treatment, and then ask another to do it after the treatment.

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* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-eighth Annual Session of the American Medical Association, New York, June, 1917.

To use the forks, hold the stop watch in the left hand, and as soon as the fork is no longer heard, press the stem of the watch, allow the numerator of the fraction to apply to air conduction and the denominator to bone conduction. After putting the C fork in vibration, place it before the ear about one inch from the orifice, being careful to avoid contact with hair, face or clothing, and in such manner that the two prongs will be parallel and not superimposed one above the other; then place the stem of the fork on the tip of the mastoid and ask the patient which is louder, and you have at once your probable Rinné.

Then starting the tests fork by fork, record both bone and air conduction with the stop watch, having the patient say "gone" when he no longer hears it. Use C 64, C 128 and C 512 on each ear as routine.

A clear brain and a considerable degree of concentration on the part of the patient being examined are needed for a satisfactory examination. Here is where the results are often uncertain. Tabulated and compared with the normal range, these tuning forks give much valuable information, but one can never assume that they are absolutely accurate, nor is a change of a few seconds either way at a subsequent visit of any great significance. If performed sufficiently often they will give us rather definite information as to the progress of the case.

The Rinné test has already been determined by the tabulated tuning fork reactions; the Weber, Schwabach, the Gelle tests, while of scientific interest, may be disregarded in the present plan. I have never found them of much aid. Should the test up to the present point have shown probability of nerve deafness, we use fork C^3 and C^4 and the Edelmann-Galton whistle; the latter, with the aid of the table provided with each instrument, gives with a considerable degree of accuracy the upper tone limit. It is sometimes difficult, in the case of the Galton, to teach patients to understand just what is meant by the difference between the whistle and the puff, but if the whistle is placed behind the ear, so that the column of air cannot be felt, this difficulty is overcome. The same is also true when using low forks, especially for bone conduction, as it is often troublesome for the party under examination to distinguish between the hearing of the forks and the feeling of the vibrations, or feeling before the ear the movement of the air current which the fork has set in motion.

Voice. Except in cases of deafness of considerable degree, few offices are large enough to make satisfactory tests by the ordinary spoken voice. Under favorable conditions this should be heard from 130 to 150 feet, or even farther, as the accentuated whisper should be heard as far as a hundred feet, while the typical whisper may be heard from 60 to 75 feet. As in most cases more or less outside noises must be taken into consideration, the average person under average conditions will scarcely hear the whispered voice 60 feet. The United States army requires a hearing distance for the whisper, of 20 feet. This is the ordinary whisper, for which the residual air in the lungs is to be used. Practice will enable one to whisper with a good degree of uniformity both in volume and pitch. For this test one ear is closed by the moistened finger in the external canal or by some sort of sound-closing apparatus, like a small moist rubber ball or a pledget of moistened cotton placed in the ear and pressed firmly against the antitragus. Even so, it is almost impossible to entirely close off the sound to the other ear, which, if it happens to be good, will be interpreted by the patient as being the ear under examination, and so be misleading. To offset this, Bárány introduced the noise machine which, when the tip is introduced into one ear, so confuses the sound to this ear as to cut out other sounds.

In my experience this apparatus has proved useful, but it has seemed sometimes to so confuse the individual as to prevent an accurate test of the ear under examination, the ear hearing both the noise machine and the fork or the voice, as the case may be, but both with less accuracy. To offset this I have tried having an assistant massage very rapidly the antitragus with an in-and-out motion over a bit of moist cotton in the external canal. This rather effectually cuts out any recognizable noise to that ear, and is not as confusing to the ear being examined.

The ear to be tested is turned toward the examiner, and the patient's eyes closed or so directed that he cannot see the speaker's lips. This seems to me a fairer test than standing behind the patient, as the external ear may more or less interfere with hearing. Some care should be used in the test words; pure vowels like *o*, *ah*, and *e* are heard farthest, but become somewhat blurred in a whispered speech, while consonants change but little. The "*h*" aspirate is the lowest and feeblest sound, being, according to Wolf's experiments, heard about one-thirtieth as far. The consonants *v* and *k*, hard *g* and *d* are heard about one-sixth as far. I use single common words and numbers, going from simple monosyllables to polysyllables. I find the *n* sounds, seven, nine, eleven, easy to recognize, while the sounds like sixty-six, seventy-seven, are more apt to be answered incorrectly. These numbers are carried up to three syllables. I am particularly fond of the numbers 100, 120, 146, etc.; next I ask questions, instructing the patient not to answer the question, but to repeat it; then I proceed to ask unexpected ones such as, "Have you had your breakfast?" "How old was Methuselah when he died?" and the like. The average of these will give about the proper distance for the whispered voice. All tests are begun at a distance beyond which you expect the person examined to hear. The conversational voice is always used when the deafness is of such degree as to warrant tests. This distance is recorded on the history chart for comparison with future tests.

Watch Test. Use the stop watch with a fairly sharp tick; this will take the place of the Politzer acoumeter, which can be discarded. Test out the individual watch on a number of normal persons to get its approximate range, and always use the same one, as no two will have the same hearing distance. The stop itself ought to have a sharp click, for this will aid us to determine whether or not the watch has really been heard, as the click will be heard at a greater distance than the tick. Patients sometimes say they hear when the click is sounded, believing that the watch has been started again by a sort of off-and-on mechanism, whereas the interval is always one, two, three, stop—reverse pointer, start. Replies to this as to all hearing tests are apt to be somewhat misleading, hence the need of so many different ones. For the ordinary case the tests above described are all that are necessary.

There remains the occasional case where one ear is so deaf that it is difficult to exclude the good ear sufficiently to determine whether we have much of any hearing, and just how much in the defective ear, all the tests described being perhaps more or less interpreted by the good ear. To assist in such cases I use a silk-covered speaking tube, with the other ear as closely stopped as possible. One can determine by speaking through this tube with a clear, distinct voice if there is any hearing. It is best to hold the edge of the funnel connected with the speaking tube against the chin rather than cover the mouth with it. The sounds are heard more clearly when it is used in this way. Next the noise machine is placed in the good ear, and the speaking tube used in the same way.

The Stenger test is used for the same purpose, and is also of value where malingering is suspected. Two A forks are struck at the same time, and with the patient's eyes closed by bandage so he cannot see the movements of his examiner, the forks are alternately advanced toward and from each ear, one in front of the malingering ear, the other in front of the non-malingering ear; only the fork will be heard which is nearest the ear.

The same test is also repeated with the eyes open, and the results compared; if the patient continues to say he hears this in the same ear as it approaches the other ear then there is a chance of simulation. The examination for recruits in the present war will require, on the part of the examiner, skill in detecting malingering. In bilateral deafness the normal ear is excluded with greater difficulty the higher up the musical scale is ascended.

All distant tests must be made with the voice as we approach the patient, and repeated until the test word is heard. When we draw away from the patient, speaking until he no longer hears, the apparent hearing distance will be greater, since the hearing having once been called into action, responds to a sound at greater distance than it would as an initial sensation.

If in doubt whether the ear under examination hears, close the one being tested, tightly, and then if sound is still heard it must have been from the good ear.

HEARING TESTS IN CHILDREN.

Here we contend with two principal difficulties: the unwillingness or the inability of the child to answer correctly. The little patients tire easily, hence the examination should be made as quickly and pleasantly as possible. When using questions it is desirable to use such as will be normally answered in the affirmative by a nod of the head, or else something which demands movement on the child's part. Prolonged examinations of children under 10 years are apt to be unsatisfactory. If the child is very deaf it will not be easy for him to distinguish between hearing a sound and feeling a vibration. Many children cannot be accurately tested until the third or fourth year in school.

Labyrinth tests do not fall within the scope of this paper, other than to mention that when it seems necessary to test the function of, and to determine the normal nystagmus we have found the caloric test (cold water) easier to perform, sufficient for diagnosis, and less troublesome to the patient than the turning tests. We do not as a rule use it where there is drum perforation.

U. S. ARMY TESTS.

For examination of the aviation corps and for the general hearing tests in the recruiting service of the United States Army, the method is as follows, so far as hearing tests are concerned:

Auditory acuity less than 20/20 in either ear is disqualifying. To obtain uniform results, the hearing of each ear is tested separately with the candidate standing 20 feet from the examiner and facing away from him 3 feet from the wall; this adds one-third of the ordinary distance at which a whisper would be heard were the person facing the examiner. An assistant tightly closes the ear not under examination by pressing the ball of the moistened index finger in the external meatus, and the examiner then exhales, and with residual air whispers various words and numbers which the candidate is required to repeat. This test should be repeated by using the ordinary low voice. The result of each test is recorded by using a fraction which has the normal test distance in feet (20) for the denominator and the distance through which the test sound is correctly heard as the numerator. In testing the hearing by the watch, an Ingersoll dollar watch is used. First determine by actual trial the average maximum distance at which five men with apparently normal hearing and normal *membranae tympani* hear the watch when their eyes are closed; this approximates 40 inches. In recording the result, this number in inches is taken as the denominator, and the distance at which the candidate hears the watch, with one ear occluded and both eyes closed, as the numerator.

A functional test for the labyrinth is made as follows: The nystagmus, the past-pointing, and the falling after turning are tested both as to direction and amount. The testing chair must have a head-rest which will hold the head 30 degrees forward and a foot-rest and a stop pedal.

Spontaneous nystagmus is tested by fixation of a point beyond the normal hearing distance. Then the head is inclined 30 degrees forward and the candidate is turned to the right, with the eyes tightly closed, ten times in exactly twenty seconds. The instant the chair is stopped, click the stop watch and the candidate opens his eyes and looks straight ahead at some distant point. There should occur a horizontal nystagmus to the left of twenty-six seconds' duration, and the candidate then closes his eyes, and is turned to the left in the same manner. There should occur a horizontal nystagmus to the right of twenty-six seconds. A variation of eight seconds is allowed.

Past-Pointing. The patient sits in the chair, eyes tightly closed, and faces the examiner and touches the examiner's forefinger in front of him, raises the arm in the perpendicular position, and attempts to find the examiner's finger, both right and left. Normally, the person will always find the finger. The patient is now turned ten times to the right for ten seconds, the chair is locked in position, and the person to be examined told to touch the finger in the same manner, right, left, right, left, right, left (three times). Normally the finger will point to the right, the past-pointing will be less each time it is tried, and on the fourth turn the finger should be touched accurately.

The same experiment is then performed by turning to the left, the patient always past-pointing in the direction of the turning. Finally the head is inclined 90 degrees downward and the patient turned to the right five times in ten seconds. On stopping, the patient raises the head, and he should then fall to the right. These test the vertical semicircular canals. He is then turned to the left in the same manner and falls to the left.

Exemptions for Mental Disabilities.—Surgeon-General Gorgas is making arrangements to provide each base hospital with a neuro-psychopathic clinic to eliminate those mentally unfit from the ranks of the army.

AN EPIDEMIC OF DYSENTERY AT THE BOSTON STATE HOSPITAL, DUE TO A MEMBER OF THE PARATYPHOID-ENTERITIDIS GROUP.

By Mary Elizabeth Morse, M.D., Boston
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and
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[From the Laboratory of the Boston State Hospital.]

(Continued from page 180)

VI. THE LEUKOCYTIC REACTION.

Gay and Claypole[10] in their experiments in typhoid immunization found that a specific hyperleukocytosis, preceded by a leukopenia, was produced in typhoid immune rabbits by inoculations with typhoid vaccine, and that the important cell in the gain was the polymorphonuclear The leukocytic response was more rapid and rose to a greater height in the immunized rabbit than in the normal animal. H. I. McWilliams,[11] in a more recent report of similar experiments with rabbits, noted a hyperleukocytosis which was not of a higher grade in the immune than in the non-immune animal.

Both Gay[12] and McWilliams[13] have described the leukocytic reaction following injections of vaccine in typhoid fever. A chill and rise in temperature are coincident with a leukopenia shortly after the inoculation, and a few hours later, with the lowering of the temperature and a lessening of symptons, there is a high-grade hyperleukocytosis. The relation of the hyperleukocytosis or "leukocytic crisis" to the freeing of antibodies indicates the possible value of these studies in vaccine therapy and prophylactic immunization.

Although our examinations have been limited to human cases and have not the exactness of results obtained in animal experimentation, they have a certain clinical value, because it has been impossible to observe these cases over a number of months.

A polymorphonuclear leukocytosis, both actual and relative, was demonstrated in one protracted case (M. G.) during the first outbreak of dysentery, after a repeated therapeutic dose of the dysenteric vaccine. Six hours after a subcutaneous injection of 75,000,000, the total count rose from 6,400 to 19,400 and the polymorphonuclears from 56% to 76%, with a loss of eosinophiles. No constitutional reaction followed successive small doses in this patient, although there was an apparent improvement in symptoms.

A polymorphonuclear leukocytosis was observed in a second case eighteen hours after an initial prophylactic inoculation of 500,000,000 and six hours after the onset of a severe constitutional reaction, with fever and vomiting. Total count 18,800; polymorphonuclears, .92;

lymphocytes, ·08; large mononuclears, transitionals and eosinophiles, 0. This was the only count made in this case. There is no record 11 months later that this patient has had an attack of the disease.

Because of these isolated observations, it seemed worth while to study the leukocytic reaction more carefully, and during the seventeen months following the first outbreak several series of examinations were made, including one woman and four men who had had neither the disease nor prophylactic treatment, and four women who had had the disease from nine to seventeen months previously. Subcutaneous injections of vaccine were given for two or three successive weeks in doses as in prophylactic treatment, beginning with 500,000,000. In two cases the counts were taken at two-hour intervals during the first 26 hours after the inoculation. In all the other cases, countes were taken during either the first twelve or the second twelve hours at one-half, one-hour, or two-hour intervals.* Differential as well as total counts were made, and a control count was made in each case. There was no constitutional reaction observed in any of these cases and the local reaction was moderate.

The leukocytic reaction consisted of a hyperleukocytosis, with the highest count rising but little above twice that of the normal count for the individual and a relative increase in polynuclears at one or more periods during the following twenty-four hours, this relative increase not always being synchronous with the highest total count.

The reaction was somewhat more marked after the second or third inoculation than after the first, except in one case in which the vaccine was injected shortly after a recurrent attack. In this case the reaction was greater after the first injection of 500,000,000 two days after the attack than after the second inoculation of 1,000,000,000, seven days later. One case (M. G.), referred to above as showing marked reaction to vaccine therapy on the first attack, showed a moderate reaction both in total and differential counts following an inoculation of 500,000,000 nine months later; and on the third day of a recurrent attack, seventeen months later, gave evidence of a reaction only in a relative increase in polymorphonuclears following an injection of 500,000,000. The diarrhea in this last instance ceased a few hours after the inoculation and there was no evident constitutional disturbance.

There is no record that the individuals chosen as normal cases in this series of examinations have had an attack of dysentery or diarrhea.

In comparing the leukocytic reaction with the clinical history in these cases the following conclusions have been made:

1. The stronger normal individuals show more reaction to subcutaneous injections of vaccine than the weaker ones who have had the disease and recurrent attacks.
2. The leukocytic reaction for the individual is more marked during or immediately after an attack of the disease and diminishes with recurrent attacks. This corresponds to the clinical observation that the resistance of the individual to the disease is lessened by a previous attack.
3. The fact that there may be a polymorphonuclear reaction to a subcutaneous injection of vaccine, coincident with the cessation of a diarrhea, would indicate the use of vaccine therapy. In the few cases in which this treatment has been given, the rssults have been favorable for a recovery from an attack.

VII. BACTERIOLOGY.

The method of isolation of the organism was that usually employed for bacteria of intestinal infections. A loopful of the fresh stool was put into a broth tube, portions containing blood or mucus, if present, being selected. After two hours' incubation, surface inoculations were made on Congo red lactose agar plates. The organism predominated on the plates during the acute stage, and was frequently present in almost pure culture. It was found as long as blood and mucus persisted and for some days after the stool began to be formed, but was not isolated after the acute stage, in cases either that recovered or that came to autopsy.

On Congo red plates at the end of twenty-four hours the colonies were round, raised, with smooth edges, translucent gray, averaging ½ mm. in diameter. During the second twenty-four hours they became an opaque gray, and increased to about 1 mm. in diameter. They did not form acid.

The organism when first isolated appeared as a small, short, thick Gram-negative bacillus. After artificial cultivation longer forms appeared. When first isolated it appeared non-motile, but after frequent replants it took on a moderate motility. It grew quickly and well on the usual media.

Cultural Characteristics—Agar—a raised, moist, gray streak with wavy borders. The growth was delicate at first, but after several replants became heavier and whiter.

Broth—a light diffuse cloud with somewhat ropy sediment.

Gelatin—not liquefied.

Litmus milk—the results were variable.

An acidity, usually slight, developed slowly (within 2-3 days) and in some cultures remained permanent as long as the tubes were observed (four weeks). Other cultures after an initial acidity became somewhat more alkaline at the end of 3-4 weeks.

Indol—tested in Dunham's peptone solution at the end of four days. One half the strains gave a negative, the other half a faint positive reaction.

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* A number of these counts were made by Mr. J. C. Rock of the Harvard Medical School.

Fermentation Reactions were tested qualitatively, in Hiss' serum water, and quantitatively in sugar-free broth containing one per cent. of the substances giving an acidity in the former medium. The substances used were dextrose, lactose, saccharose, maltose, dextrin, salicin, glycerin, and mannite.

TABLE I.

QUALITATIVE REACTIONS OF EPIDEMIC ORGANISM.

Litmus Milk	Indol	Fermentation Reactions (Litmus Serum Water)							
		Dextrose	Lactose	Saccharose	Mannite	Maltose	Dextrin	Salicin	Glycerin
Acidity, slowly changing to alkalinity in some strains; permanent acidity in others.	0 or faint +	+ gas	0	0	+ gas	0	0	0	0

TABLE II.

ACIDITY IN ONE PER CENT. SUGAR-FREE BROTH.

Culture	Dextrose	Lactose	Saccharose	Mannite	Maltose	Salicin	Glycerin
M	+3.4	—0.8	alk.	+3.4	+0.2	alk.	+1.3
B	+1.7	—0.4	+1.8	+2.8	+0.1	"	+1.9
P	+4.3	—1.0	alk.	+3.2	+0.3	"	+0.8
A-15-24 Heart	+1.9	—0.2	"	+2.4	+1.1	"	0.0
L	+3.4	—0.9	"	+3.2	+1.1	"	alk.
W	+2.2	—0.8	"	+3.5	0.0	"	+0.8
Paratyph. A	+3.1	0.0	"	+3.7	0.0	"	+1.2
Paratyph. B	+2.8	0.0	"	+4.0	0.0	"	+1.5
B. suipestifer Ark.	+2.0	—1.3	"	+2.6	+0.3	"	alk.
B. suipestifer Md.	+1.9	—1.2	"	+3.0	+0.5	"	"
Paracolon No. 17	+1.5	—0.7	"	+2.8	+0.3	"	"
Paracolon No. 26	+1.7	—0.6	"	+3.0	+0.4	"	+1.5
B. enteritidis	+2.0	0.0	"	+3.0	0.0	"	+1.0

The qualitative results are given in Table I and the quantitative in Table II. The only substances broken down by all strains are dextrose and mannite, the former usually and the latter always with gas production. Saccharose and glycerin were slightly affected in isolated instances. Salicin, dextrin, and maltose were not attacked.

A strain of paratyphoid *A* and *B*[*], two each of B. suipestifer[†] and "paracolon bacilli,"[*] and one of B. enteritidis Gärtner[†]—were studied for comparison, and the results are included in the quantitative table.

The colon-typhoid group is divided primarily into a lactose fermenting (B. coli) and a lactose-negative group. The latter is again subdivided according to the action on mannite; no change, B. dysenteriae Shiga; acid only, B. typhosus, B. dysenteriae Flexner; acid and gas, paratyphoid-enteritidis group. The members of this last group are negative to saccharose and salicin and must be distinguished one from another by their agglutinative affinities. The present organism falls in a broad way in the paratyphoid-enteritidis group, as it is a lactose-negative bacillus, forming acid and gas in mannite, and not acting on saccharose and salicin. It differs from the generally accepted characters of the group, however, in a number of particulars. A characteristic of the strains isolated in this epidemic is the variability of their action in milk and in the production of indol. Each strain has retained its original characteristics in these respects after more than a year of artificial cultivation. The paratyphoid-enteritidis group is supposed to form no indol, to ferment maltose with gas formation, and paratyphoid *A* to give a permanent acidity in milk while the other members of the group give an acidity followed by alkalinity.

Recently, however, Krumwiede, Pratt and Kohn[14] have questioned the value of litmus milk as a medium for differentiating paratyphoid *A* from B, as in a series of representations of the group they found that the difference was quantitative only, and that there were numerous intermediate degrees of reaction.

The paratyphoid-enteritidis group is admittedly especially complex and unstable, and the question of the identity or mutual relationships of its members is very confusing and is still unsettled. The cultural and chemico-biological characteristics of various members of the group are essentially the same, so that subdivision according to these is impossible. Agglutination reactions,[15] however, while demonstrating the near relationship of members of the group, do permit a further differentiation into a paratyphoid B and a "Gärtner-enteritidis" sub-group. Gärtner antisera do not agglutinate paratyphoid B bacilli, and conversely B. antisera do not influence Gärtner bacilli. Complement-fixation also shows a separation of the group into the same subgroups. Paratyphoid *A* seems to go in the Gärtner, and B. suipestifer in the *B* subdivision. Paratyphoid *B* is quite uniform in cultural and serological reactions, while the Gärtner group is more irregular in both respects.

In addition, other strains have been described which agree in most cultural characteristics with the group, but are not agglutined by paratyphoid *B* or enteritidis antisera. Immune sera for these strains usually agglutinate only their homologous organisms. These may represent transitions between the two subdivisions. Certain of these cultures have been described under the title of paratyphoid *C*.

As to the normal habitat of members of the group: according to Bainbridge[3] true paratyphoid *A* and *B* are never found except in connection with human disease, while the other members of the group are associated with animals. The normal habitat of B. suipestifer is the intestine of mice and pigs. B. enteritidis is frequently present in the intestine of healthy rats, and this animal is an important source of the organism. The bacillus also causes an infection of cows and calves. The organism has been the cause of frequent epidemics of meat poisoning, the meat either coming from infected animals, or having been contaminated after slaughter, presumably by rats.

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[*] Obtained from the American Museum of Natural History.

[†] Obtained from the Harvard Medical School. B. suipestifer Arkansas and Maryland.

VIII. AGGLUTINATIONS.

A series of agglutination reactions was done, using the sera of recovered and vaccinated patients and of immunized rabbits with the epidemic strains and also with several representatives of the paratyphoid-enteritidis group which had been studied culturally; also the epidemic strains with rabbit antisera for the same representatives of the group.

The points in view were: the extent of agglutinin formation in the disease, its relation to the type of the disease, persistence of agglutinins after recovery and prophylactic vaccination, and the placing of the epidemic organism in the paratyphoid-enteritidis group.

One or more tests were made on 78 persons. The serum of a normal non-exposed person was used as a control.

The reactions were done by the macroscopic method, using formalized cultures as antigens. For the homologous antigen with patients' sera a mixed antigen was used, made of four strains isolated from the feces; two from the heart's blood and one from the intestinal wall of fatal cases.

All the dysentery cases tested gave a positive reaction in dilutions varying from 1/10 to 1/120. Twenty seven cases of diarrhea occurring in patients and employees at the West Group during the outbreaks of dysentery also agglutined in dilutions varying from 1/20 1/100.

Agglutinin formation in the disease, as shown by these results, is very moderate. The highest complete reaction obtained was 1/120. The majority of the sera obtained to within four weeks after onset agglutinated completely only to 1/40, smaller numbers to 1/80 and 1/100, a few only 1/10 and 1/20 (see Chart 2). As to the relation between the type of the disease and the strength of the agglutination reaction, Chart 2 shows that reaction in high dilutions were more frequent among the dysentery than among the diarrhea cases.

Repeated observations on 12 patients who had a single attack (see Table III.) show that there is a rapid drop in the titre during the first few weeks, in some cases a drop to 1/2 or 1/5 between the 3d and 4th week, and that agglutinins persist (at a low level) in some cases for a considerable time,—as long as 17 months in one case and 14 months in two others, although single negative results appear at 5 to 11 months.

Table III.

Persistence of Agglutinins after a Single Attack of Dysentery.

Case	Time between Onset and Test	Highest Complete Reaction
M. Br.	3 wks.	1/40
	10 mos.	1/20
	14 "	1/10 partial
Wm. B.	3 wks.	1/80
	5 mos.	1/20
	17 "	1/10 partial
M. Cl.	3 wks.	1/80
	4 "	1/40
	5 mos.	1/20
Wm. Cu.	3 wks.	1/100
	4 "	1/20
	5 mos.	neg. 1/10
C. F. H.	3 wks.	1/100
	4 "	1/80
	10 mos.	1/10
	14 "	1/10
M. Ga.	3 wks.	1/100
	5 mos.	1/40 therapeutic vaccine treatment
R. Pr.	2 mos.	1/40
	6 "	1/20
Th. S.	2 wks.	1/100
	3 "	1/80
	2 mos.	1/20
	10 "	1/20
	14 "	1/20
Geo. H.	3 "	1/20
	11 "	1/10 partial
M. McD.	2 wks.	1/100
	3 "	1/40
	13 mos.	1/10
M. Don.	2 wks.	1/40
	6 mos.	1/10
	11 "	1/10
Ger. W.	2 wks.	1/40
	8 mos.	1/20
	11 "	neg. 1/10

After prophylactic vaccination repeated agglutination tests were made on 10 patients at intervals up to 10 months. In the majority of cases the titre within a month after inoculation ranged from 1/80 to 1/150, but in one case was 1/20. Values of 1/20 and 1/10 were usually obtained at 5 to 6 months and 1/10 at 10 and 11 months.

No extended observations on the persistence of agglutinins after paratyphoid infections are available, although, on the strength of tests on single cases, they are said to disappear rapidly. Dreyer[4] has found agglutinins for *B* are always high, while for *A* they are low, after either the disease or vaccination, as compared with *B* or typhoid.

The following antigens were also tried out with a limited number of patients' sera and with rabbit serum for the epidemic strains: paratyphoid *A*. and *B*. B. suipestifer Arkansas, B. enteritidis,* and the strain of paratyphoid *A* isolated in the hospital epidemic of 1910.

TABLE IV.

SERA OF RECOVERED PATIENTS WITH DIFFERENT ANTIGENS.

PATIENT'S SERA	DILUTIONS	MIXED STRAINS B. S. H. EPIDEMIC	PARATYPHOID A. N. Y.	PARATYPHOID B. N. Y.	B. ENTERITIDIS	B. SUIPESTIFER ARK.	PARATYPHOID A. B. S. H.
O'B	1/10	+	+	±	+	+	±
	1/20	+	—	±	+	+	±
	1/40	+	—	±	+	±	±
	1/80	+	—	±	+	±	—
	1/100	±	—	±	+	±	—
W	1/10	+	—	—	+	+	∓
	1/20	+	—	—	+	+	∓
	1/40	+	—	—	+	+	∓
	1/80	±	—	—	+	+	∓
	1/100	±	—	—	+	±	∓
McD	1/10	+	±	—	+	±	±
	1/20	±	±	—	+	∓	±
	1/40	±	±	—	—	—	±
	1/80	±	±	—	—	—	±
	1/100	±	±	—	—	—	—
M	1/10	+	∓	—	. .	±	—
	1/20	+	—	—	. .	∓	—
	1/40	+	—	—	. .	∓	—
	1/80	±	—	—	. .	∓	—
	1/100	—	—	—	. .	—	—
O'M	1/10	+	—	—	. .	—	—
	1/20	±	—	—	. .	—	—
	1/40	±	—	—	. .	—	—
	1/80	±	—	—	. .	—	—
	1/100	±	—	—	. .	—	—
C	1/10	+	—	±	. .	+	∓
	1/20	+	—	±	. .	±	∓
	1/40	±	—	—	. .	±	∓
	1/80	±	—	—	. .	±	∓
	1/100	±	—	—	. .	±	∓
S	1/10	+	+	+	. .	+	+
	1/20	+	±	+	. .	+	±
	1/40	±	±	+	. .	+	—
	1/80	±	—	—	. .	±	—
	1/100	±	—	—	. .	—	—
Normal	1/10	±	—	∓	+	—	∓
	1/20	—	—	∓	+	—	∓
	1/40	—	—	—	—		—
	1/80				—		—

±=almost complete.
∓=trace.

The results with patients' sera, given in Table IV. show first, the presence of group reactions; second, the absence of strong reactions with paratyphoid *A* and *B*; third, the non-identity of the present organism with the one isolated in the epidemic of 1910; and fourth, high agglutinations of two sera with B. enteritidis, although these results must be discounted to a certain extent by the reaction of the bacillus with normal serum. With stock paratyphoid *A* and *B* sera the epidemic strains reacted scarcely at all (partially at 1/10.)

TABLE V.

RABBIT ANTISERA WITH DIFFERENT ANTIGENS.

SERA	DILUTIONS	MIXED B. S. H. EPIDEMIC	B. ENTERITIDIS	B. SUIPESTIFER	PARATYPHOID A. N. Y.	PARATYPHOID A. B. S. H.	PARATYPHOID B. N. Y.
Rabbit › mixed strains of B. S. H. epidemic	1/10	+	+	+	+	—	+
	1/50	+	+	+	+	—	+
	1/100	+	+	±	±	—	±
	1/200	+	+	±	—	—	±
	1/300	+	+	±	—	—	∓
	1/400	±	+	±	—	—	∓
	1/500	±	+	±	—	—	∓
	1/1000	±	+	—	—	—	—
Rabbit › B. enteritidis	1/10	—	+	. .	+	. .	+
	1/50	±	+	. .	+	. .	+
	1/100	±	+	. .	+	. .	+
	1/200	—	+	. .	+	. .	+
	1/300	—	+	. .	+	. .	±
	1/400	—	+	. .	+	. .	±
	1/500	—	±	. .	+	. .	∓
	1/1000	—	±	. .	±	. .	∓
	1/1500	—	±	. .	±	. .	∓
	1/2000	—	±	. .	—	. .	∓
Rabbit › B. suipestifer	1/10	±	+	+	—	—	+
	1/50	±	+	+	±	—	+
	1/100	±	+	+	±	—	+
	1/200	—	+	+	±	—	+
	1/300	—	+	+	±	—	+
	1/400	—	+	+	±	—	+
	1/500		+	+	±	—	+
	1/1000		+	+	+	—	+
	1/1500		+	+	±	—	—
	1/2000		—	±	—	—	—
Normal Rabbit	1/10	—	—	—	—	—	—
	1/50	—	—	—	—	—	—
	1/100	—	—	—	—	—	—

±=almost complete.
∓=trace.

A rabbit was immunized with five subcutaneous doses of living broth culture of the same epidemic strains used for the mixed antigen. The antiserum (see Table V) agglutinated the homologous antigen completely at 1/300, and almost completely at 1/1000. It reacted with B. enteritidis better than with the homologous strains, giving a complete reaction at 1/1000. It agglutinated weakly (1/50 complete) paratyphoid *A* and *B* and B. suipestifer, but did not affect the Boston State Hospital strain *A*. These results agree in a general way with those obtained from patients' sera.

A strong anti-enteritidis rabbit serum was prepared, which agglutinated the homologous culture completely at 1/1500 and almost completely at 1/2000. Curiously, it reacted only slightly (partially at 1/50 and 1/100) with the epidemic cultures. It gave a moderate reaction with paratyphoid *B*, but with *A* reacted almost as well as with its own antigen.

A strong antisuipestifer serum (complete at 1/1500) also reacted only weakly with the epidemic strains, but as well with B. enteritidis as with its own antigen; it also agglutinated paratyphoid *B* in high dilutions (1/1000) but paratyphoid *A* only moderately.

(To be continued.)

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* For the sources and cultural characteristics of these strains see page 218 and tables III and IV.

Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

The forty-seventh meeting of the New England Pediatric Society was held in the Boson Medical Library, Friday, February 23, 1917, at 8.15 P. M., the president, DR. MAYNARD LADD of Boston, in the chair.

The following papers were read:

1. Certain aspects of epilepsy in children—George Clymer, M.D., Boston.
2. Hemorrhagic conditions, with especial reference to purpura—George R. Minot, M.D., Boston. Discussion opened by Beth Vincent, M.D., Boston.
3. Iliac adenitis and abscess—Charles J. Mixter, M.D., Boston.

General discussion of Health Insurance.

DR. CLYMER'S PAPER.

DISCUSSION.

DR. WALTER B. SWIFT: I should like to say a word about other phases. Epilepsy has a speech sign in it as one of the numerous aspects that should be brought to your attention. This speech sign is not one of the numerous signs that I have given out, but has been given to the literature by Dr. L. Pierce Clark of New York. It consists in a rather monotonous speech that lacks flexibility and is pitched a bit high, and is somewhat like this (illustrating).

You see that the sign is monotony, high pitch and lack of flexibility. For these reasons it has been termed the "plateau voice." Dr. Clark claims that it occurs in about 75% of cases and he has several times suspected epilepsy merely from the voice, and has found his suspicion confirmed by further examination.

There is another aspect that I wish to call your attention to, and that is that epilepsy is passing through a certain stage in medicine at the present time. It seems to be somewhat similar to the stage through which hysteria has passed. In the materialistic days, hysteria was considered to be the uterus wandering around in the inside. A number of years afterward, Janet, of Paris, a psychologist, saw the limitation of color fields and the lack of sensation and passing paralyses, and with his psychological eye came to the conclusion that hysteria was a limitation of consciousness. Then came Babinski,—he was a great observer, and he saw these same things, but he noticed that they could be made to disappear through the use of suggestion. He, therefore, claimed that hysteria *was* suggestion. Late years has come Freud, who has interpreted hysteria as the external manifestation of subconscious complexes and with him the medical world—at least half of it—has been swung over to this view.

What does all this mean? It means that certain men with certain training have shed the light of their training upon the same object and have made an interpretation of it from their own personal training. These are, in a great measure, the steps through which medicine, itself, in a large sense, has passed within the last hundred years. And this, also, is the condition in epilepsy at the present time. It is now passing from a somatic to a psychic interpretation. There are men arrayed on both the psychological side and the somatic side.

My own study in this field of epilepsy would incline me to follow a line of cleavage between these two. I see no reason why a psycho-somatic etiology cannot be proven. To do this we should look for something on the pathological side that is sufficient to cause the symptoms and the psychological appearances. I see no reason why the unit of etiology behind all these phenomena could not very well be hydrocephalus. Of course I know there are exceptions, but hydrocephalus has been found in many cases already. It is possible that in cases where it has not been found that there has been a partial hydrocephalus or a minutely located hydrocephalus, and that still further investigation may reveal that hydrocephalus itself, either large or finely located, is etiology enough, or that something that acts just like it may be etiology.

Sure it is that as we review all the symptoms and as we look at the anatomy of the ventricles where internal hydrocephalus occurs and see how pressure of too much fluid can vitiate the functions of nerve fibres and nerve cells, it is really quite plausible to think that after all the etiology may be nothing more than a large or small hydrocephalus.

DR. POWERS: There is not one thing in Dr. Clymer's paper which I can dispute and I certainly share with him his optimistic point of view. I think that by speaking in this optimistic way he is helping all of those who are treating epileptic patients.

In January, 1913, at the suggestion of Dr. Swift, I began to study the problem of the treatment of epilepsy. We had a great many cases of epilepsy at that time in the Nerve Clinic at the City Hospital, and they were looked upon as a nuisance. I think they are very interesting material to work on. I had some x-ray pictures of the skulls taken and bismuth x-rays of the intestines. The radiographs of the skulls showed nothing, but those of the intestines showed stasis. I placed the patients upon a diet which I consider merely a reasonable one for patients suffering from constipation and intestinal indigestion. They were given laxatives and abdominal massage, when it was possible. I believe that the massage helped them, but it is difficult to say how much. In giving abdominal massage, I begin at the caecum and massage the whole colon, spending more time on the hepatic flexure than elsewhere, because stasis most often occurs there, especially when the transverse colon is low and the hepatic flexure has, therefore, become a sharp angle. As it was not possible to give manual massage in all cases, I devised a method of self massage with wooden dumb bells, which has been taught to some of the patients. For a year I have treated nearly all cases without bromides, but have given sodium bicarbonate. I am not ready to say that I think that the bromides are useless, and think that I shall now begin to treat another series of cases with bromides for comparison with those treated without them. I have not used calcium lactate in many cases. I believe that the toxin which produces the attacks is an acid and that calcium lactate, acting as an alkali, may neutralize it. It is for that purpose that I use sodium bicarbonate. To treat a case of epilepsy requires a good deal of patience and time spent in inquiring into such commonplace matters as the diet which the patient is accustomed to and the kind and amount of exercise he has. This is not interesting to many neurologists and does not appeal to them.

Dr. Drowne: The details of the method which I am using are so involved, and the success depends in such a degree upon the thoroughness with which the details are carried out, and also the manual skill acquired, that it does not seem to me advisable to talk or write about them. They can be shown and the technic acquired by others.

Dr. Clymer (in closing): I should like to testify to the very good results obtained by Dr. Drowne in certain of his cases which I have seen. I think we should all be interested in the work he is doing.

HEMORRHAGIC CONDITIONS.

(Abstract.)

Dr. George R. Minot, Boston: Hemorrhagic conditions, due to a recognized abnormality of the blood, are associated with a diminished number of platelets, or with alteration of these elements or of other factors involved in the coagulation of the blood. The various types of purpura hemorrhagica are the conditions with diminished numbers of platelets, while in hemophilia, in certain types of cholemic hemorrhages, sepsis, and in some cases, at least, of melena neonatorum, the platelets occur in approximately normal numbers. In studying these conditions, it is necessary that the following tests be properly performed.

1. Enumeration or estimation of the platelets.
2. The bleeding time.
3. The coagulation time, with observations on,
   (a) the time of onset and termination of coagulation.
   (b) reclotting phenomenon;
   (c) retractility of clot;
   (d) firmness of clot;
   (e) effect of suitable amounts of calcium on the coagulation time.

The tests for prothrombin time, antithrombin and fibrinogen may be of value in certain instances.

Purpura hemorrhagica is that condition in which there is bleeding from one or more mucous membranes, and usually purpuric skin lesions. There is a marked diminution of the blood platelets, a delayed bleeding time, a normal or slightly delayed coagulation time, and a soft non-retractile clot. Purpura hemorrhagica is not to be confused with other types of purpura or scurvy which have an essentially normal number of platelets and no definite alteration of their coagulation factors. Purpura hemorrhagica may be an idiopathic disease or appear as a symptom secondary to some disease, as pernicious anemia, lymphatic leukemia, diphtheria, etc., etc. The idiopathic type may occur in the following forms:

1. Continuous acute or chronic acquired or congenital.
2. Intermittent.

In the former the platelets are continuously below normal, while in the latter they are below normal during the attacks only.

Idiopathic aplastic anemia has often undoubtedly been confused with purpura hemorrhagica, as both conditions present anemia and purpura. It may well be that these two conditions are not so distantly related as is perhaps evidenced by the fact that cases may be recognized that form an intermediate type of condition between them and suggest a partially depressed activity of the marrow which especially involves the platelet elements.

In typical aplastic anemia there is no evidence of regeneration of the erythrocytes, polynuclear leucocytes, or platelets, the blood elements originating in the marrow. In typical purpura hemorrhagica there is evidence of regeneration of erythrocytes and polynuclears but not of the platelets, though they may be formed as normally from the megakaryocytes of the marrow but rapidly destroyed in the circulation.

Diminution of platelets and thus primary or secondary purpura hemorrhagica may be due to:

1. Destruction or depressed activity of the megakaryocytes with or without similar action on the other elements of the marrow; by some unrecognized or recognized toxin, or by congenital absence of these elements.
2. Displacement of the megakaryocytes by abnormal cells, as occurs in lymphatic leukemia, pernicious anemia, metastatic tumors, etc.
3. Destruction of platelets in the circulation.

Hemophilia occurs in males only and is usually hereditary. Hemorrhages into muscles and joints are frequent. Purpuric skin lesions probably never occur. The blood findings are in contrast to those of purpura hemorrhagica. The platelets occur in essentially normal numbers, but are physiologically qualitatively defective. The bleeding time is essentially normal. The clot is retractive and firm. The coagulation and prothrombin time are usually much delayed. One must, however, note that some cases have but a very slightly delayed coagulation time or rather a delayed time demonstrated only by refined methods or by demonstrating the reclotting phenomenon.

In melena neonatorum there occurs a delayed, often markedly delayed, coagulation time, perhaps associated with prothrombin alteration or deficiency.

The one condition where there is a marked increase of antithrombin is in experimental peptone poisoning.

Diminution in the amount of fibrinogen as a cause for hemorrhages is to be found in conditions in which the liver is severely damaged, as in phosphorus and chloroform poisoning and far advanced atrophic cirrhosis; though diminution of platelets and perhaps a fibrinolytic ferment play a part in this latter condition.

Certain cases with defective bile secretion or biliary fistula may give some disturbance of liver function which affects the coagulation factors and causes hemorrhages.

The lack of calcium available for purposes of coagulation in the blood is probably wholly in some and partly in other instances accountable for the hemorrhages seen with certain cases of prolonged obstructive jaundice. Instances of actual diminution of calcium as a cause for hemorrhage are notably rare.

The administration of calcium for therapeutic purposes is indicated only in those cases associated with diminished amounts of either available or total calcium.

The best treatment for the other hemorrhagic conditions is a suitable amount of transfused blood from a donor of the same isoagglutination group. If it be to replace diminished or defective platelets the effect will last as long as the life of the platelets, *i. e.*, about three to five days, though in some instances a rapid destruction of such platelets seems to occur and the effect is then shorter. A permanent or marked temporary rise of platelets following a transfusion in purpura hemorrhagica is referable to a stimulation of the patient's platelet-forming elements or to a prevention of their destruction. Repeated transfusions are especially indicated in conditions where the toxine is recognized and its source has been removed, as in the aplastic anaemia of benzol poisoning. By so doing the bone marrow has a chance to regenerate. Transfusion, especially early, in melena neonatorum is in many instances curative. In purpura hemorrhagica it is often temporary only.

The next best treatment to transfusion is the use of thromboplastic preparations derived from fresh tissue juice. Tissue juice accelerates the coagulation of blood markedly, as do platelets. This action of tissue juice has been recognized for years, but it has been but occasionally used for therapeutic purposes. With Howell's discovery that certain extracts of brain having the properties of kephalin exert a marked thromboplastic action, it has been quite simple to obtain concentrated, stable and active preparations. A thromboplastic preparation has been used by Fonio under the name of coagulen.

DISCUSSION.

Dr. Vincent: A vital defect in the blood itself is probably the basis of the purpuric conditions observed in various diseases in infants and children. In some instances this defect is apparently congenital, as in hemophilia and hemorrhagic disease of the newborn; in others it is evidently acquired during the course of the disease, and is only a symptom of the disease, as in certain cases of obstructive jaundice in aplastic anaemia and in the various purpuras. Some of these conditions improve without treatment and others, aplastic anaemia for instance, are fatal in spite of any treatment, but in all of them, as regards the symptom of hemorrhage, transfusion has proved the most effective measure. Transfusion is effective in two ways. It corrects, temporarily at least, the abnormal tendency to bleed and makes good the loss of blood.

At times in these purpuric conditions it is very difficult to make the correct diagnosis and to say whether we are dealing with an incurable disease or whether it is self-limited and one from which the patient can recover if he does not succumb to the loss of blood. In this group, in the absence of a positive diagnosis, it is advisable to try the effect of one transfusion and perhaps a second. To go beyond this is probably useless. In my experience with these purpuric conditions the need of repeated transfusions means a grave prognosis. Each transfusion becomes less and less effective. They may delay the fatal result but do not essentially alter the course of the disease.

Bleeding in obstructive jaundice in infants is sometimes seen in cases of congenital malformation of the bile ducts. Here the blood defect is a lack of available calcium as shown by the "calcium in vitro" test. These cases should be given calcium lactate by mouth. One sometimes sees a case of permanent biliary fistula after operation that finally develops a pathological tendency to hemorrhage, which seems to be associated with the absence of bile from the intestinal tract. These cases should be given ox-gall until the faeces are a normal color. In either instance if the bleeding is acute and the condition serious, transfusion is indicated.

In small children and infants the main difficulty encountered in transfusion is associated with the small size of the veins. If those at the elbow and ankle are too small, the external jugular may be used. In infants with an open fontanelle the blood is very easily injected into the longitudinal sinus.

ILIAC ADENITIS AND ABSCESS.

Dr. Charles G. Mixter, Boston: Iliac abscess is a condition that one does not find mentioned in the text-books of pediatrics, and in the text-books of surgery it is only broadly considered under the discussion of retroperitoneal abscesses. In this connection the abscess starts along the spine in the lumbar region or about the kidney, and by gravitation the pus works downward and points not infrequently above Poupart's ligament. The lesion is primarily a lumbar abscess. Again, one sees an abscess in the iliac fossa, secondary to a bone lesion of the pelvis not infrequently. Here osteomyelitis of the ilium or one of the other bones of the pelvis is the primary cause. Such secondary abscesses belong to the consideration of the primary disease and will not be included here.

Iliac adenitis and abscess in children, however, is such a definite surgical entity, that its symptomatology should be understood and its importance emphasized. Similar to gland infection elsewhere, there is, first, an acute adenitis of the iliac glands, by invasion through some portal of entry. At this stage the infection may subside and the glands gradually diminish without giving rise to further trouble. If the inflammatory process continues, focal necrosis takes place within the glands, periglandular tissue is formed and a hard, indurated mass is palpable low down in the iliac fossa above Poupart's ligament. When this stage is reached the process rarely subsides; usually there is slow softening of the glands, with the formation of an abscess which pushes the parietal peritoneum inward and fills the iliac fossa. As the abscess enlarges it may descend occasionally into the pelvis when under great tension, bulging inward from the lateral wall, but never passing beyond the median line, where it is limited by the firm attachment of the peritoneum.

Iliac abscess is infrequently met with; in the last eight years only nine cases have been admitted to the surgical service at the Children's Hospital. We have seen it more frequently in boys than in girls, in the ratio of three to one, and chiefly in younger children. Only two of the children were over four years of age; seven were between one and a half and four years. In a considerable number of cases the iliac adenitis immediately followed a sore throat, cold or bronchitis, thus resembling many of the cases in the so-called milk infection epidemics, where the sore throat has been accompanied by marked abdominal symptoms. These cases would suggest that the adenoid tissue of the tonsillar ring may serve as a portal of entry. Chicken-pox and, particularly, measles are shown by the histories in many instances shortly to have antedated this condition. In one case a septic abrasion was noted on the foot on the corresponding side, and in another, the glands in the femoral region had previously been involved.

The record of the following patient will best illustrate the course of a typical case.

R. D. 2½ years old, girl baby. Referred to the Surgical out-patient department for an acute condition of the left hip. There was no family history of tuberculosis. One year ago the child had whooping cough. Otherwise always well. Ten days ago had a severe cold. Has not completely recovered from it. Four days ago child fell off a chair, since then a limp has been noticed. Refuses to walk today. Has complained of some pain in the abdomen and left hip. Feverish for the last 24 hours. No night cries. Bowels have moved daily. No vomiting.

Well developed and nourished. Physical examination negative except for abdomen and lower extremities. No glandular enlargement. Abdomen full but not distended, no spasm, some tenderness in the left lower quadrant and definite induration above Poupart's ligament. Left thigh flexed at 90 degrees. Rotation at hip free—pain and resistance on extension. Some spasm of hamstring muscles. Reflexes and measurements normal. White count 44,000. Temperature 102 degrees.

The child was referred to the house, and flaxseed poultices were applied to the abdomen. At the end of a week the abscess was opened extraperitoneally and drained. The wicks were removed on the eighth day. At the end of three weeks the sinus had healed, all spasm about the hip had disappeared and there was no limp.

The onset is generally subacute, symptoms in most cases having been noted for two or three weeks before the child was brought to the hospital. At first there is malaise and fever, followed in a few days by a noticeable limp and a persistent flexion of the thigh. This is the symptom on which the parents lay greatest stress. In the more severe cases the thigh will be held sharply flexed on the abdominal wall. Pain is referred usually to the hip, at times to the abdomen, but is usually not intense unless the limb is moved. Vomiting is rare and the bowels generally are regular, though occasionally there is abdominal distention and constipation. There are no night cries.

On examination the child is fretful, feverish, temperature 99 degrees to 102 degrees, and lies with one or both legs drawn up. The leg on the unaffected side can be readily extended, but any attempt to straighten the other leg will be met with a sharp outcry of pain and violent muscular resistance. The abdomen is soft, and involuntary muscular spasm is absent. Voluntary muscle spasm is found over the iliac fossa in which lie the inflamed glands, and when this spasm is overcome, induration can be detected above Poupart's ligament, or a definite mass may be felt in the more advanced stage.

The examination of the hip is of the utmost importance. Every effort should be made to have the child quiet, and the manipulations should be carried out with gentleness. With the leg in flexion, rotation is free, adduction and abduction are only slightly limited, if at all, and the thigh can be flexed until it causes pain by pressing on the abdomen. On the other hand, any attempt at extension is met with an outcry of pain, marked resistance and tilting of the pelvis from splinting of the psoas muscle. All measurements of the two legs are equal.

Rectal examination, which is of great value in many obscure lesions of the abdomen in children, will usually reveal a unilateral induration, or definite tense, tender abscess. The white count is elevated, varying from fifteen to forty thousand. The von Pirquet reaction is of importance only when negative, as so often happens in the diseases of childhood.

The failure to make a correct diagnosis of iliac abscess arises from the lack of recognition that has been accorded this condition. It is not included in the differential diagnosis when a case is met with. Not one of the nine cases was sent to the hospital with a correct diagnosis of the condition. Where the lesion occurs on the right side it is most often mistaken for an appendix abscess. In the latter condition the onset is more acute and there is involuntary spasm of the rectus muscle, and generally distention, or some intestinal disturbance. Resistance to extension of the leg is less marked. Where the abscess has extended into the pelvis, it gravitates to the pouch between the rectum and the bladder and commonly lies to the left as well as the right of the median line. In appendicitis with pelvic peritonitis in children, vesical irritation is frequent; generally pain on micturition and in consequence a distended bladder; sometimes frequency of urination. This symptom is absent in iliac abscess.

In psoas abscess the onset is more insidious, the child has night cries and a lesion of the spine can be demonstrated. A negative von Pirquet is important. The white count is lower and there is greater fluctuation between the morning and evening temperatures.

Where a lumbar abscess has pointed above Poupart's liagment there is tenderness and resistance in the loin and in the costo-vertebral angle.

In acute infections of the hip slight motion elicits pain and is limited in all directions. There is definite spasm of the adductor muscles and the resistance in the iliac fossa is absent. In epiphysitis and osteomyelitis there is thickening and localized tenderness.

In the treatment of iliac adenitis we find that rest in bed and frequent hot applications to the abdomen, to break the abscess down and bring it to the surface above Poupart's ligament, is preferable to early operation. The safety of the operation is far greater, as the chance of opening the peritoneal cavity is greatly diminished; and where the gland tissue is thoroughly broken down, the period of drainage is much shorter than when a large amount of necrotic lymphoid tissue has to slough out gradually. Even when a palpable tumor has formed above Poupart's ligament, the inflammatory mass may in rare instances subside without drainage, as occurred in one of our cases.

When a well-marked abscess has formed low in the iliac fossa, an incision is made above and parallel to Poupart's ligament, slightly below the anterior superior spine of the ilium. The peritoneum is pushed inward and upward without entering the abdominal cavity and the abscess is evacuated. Any necrotic gland tissue is gently wiped out and the cavity is drained with a rubber tube or cigarette wicks.

Cultures from the pus may show a growth of either streptococcus or staphylococcus. In one case the colon bacillus was found.

With proper drainage a favorable outcome may be expected in these cases. The spasm around the hip subsides and there is a rapid complete return of function. A discharging sinus will persist for a variable length of time, from three weeks to two months, depending upon the amount of the necrotic gland substance which has to separate.

In conclusion I would like to emphasize again the importance of bearing iliac adenitis in mind when an obscure condition in the lower abdomen or a puzzling lesion of the hip is encountered.

ADDRESS ON HEALTH INSURANCE.

Dr. A. N. Broughton, Jamaica Plain: Four years age, the Workmen's Compensation Act was passed by our legislature and was an attempt to solve the unsatisfactory relations throughout the industrial world in the matter of industrial accidents. The Act was hailed as a great advance in social legislation, and great claims were made that under it, workmen would be far better treated in the matter of compensation and in the efficiency of their medical service, than ever before. As chairman of the committee of the Massachusetts Medical Society, I have given some attention to this Act for the last year, and know that the claims made for it in a very large measure have not been substantiated, and that a great deal of necessary effort has been put forth so to amend the statute as to make it really effective.

Now, to quote the words of Prof. Doten, who introduced the bill for social insurance last year in the legislature: "Having gotten the Workmen's Compensation Act satisfactorily into working order, the Association for Labor Legislation then turned its attention to health insurance," with the purpose of establishing that as the next important social legislation. There are two matters particularly involved in this proposal for health insurance. In the first place, as to the principle itself—is there any reason to believe that any considerable part of the benefits claimed for it would occur? This principle, put into operation, would enormously affect 75 per cent. of the practice of 75 per cent. of all the doctors throughout the state. It is in its very essence a medical problem, and it is entirely proper that the profession should first ask how much assurance there is that the benefits claimed by the proponents of health insurance would be actually realized. In this connection, our experience with the Workmen's Compensation Act has not been reassuring. It is fair to say that with every intention of helping in the future, as in the past, all measures which will advance preventive medicine, a very large part of the profession is critical of the efforts of the Association for Labor Legislation to force this matter along. And there is no question in my mind that it is the methods by which the attempt has been made to advance it, which have been the subject of criticism more than the principles involved, entirely proper as it is that these principles should be critically studied and thoroughly investigated. I do not believe that the profession at large is satisfied that the experiment as tried in Germany or in England has been sufficiently convincing to warrant its trial in this country, save under very different conditions and safeguards.

Next to the question of the principles involved, the second point centers again around the methods by which the proponents of this legislation have sought to advance it. This is very largely a medical problem, but in all the councils and in the Association itself, which has undertaken to establish this form of insurance, the medical profession is singularly unrepresented. The number of practising physicians who are active in the Association or who have been consulted, in this state particularly, has been almost negligible. That is the great objection in my mind and in the minds of a very great many of the profession throughout the state, to the whole matter. If the Massachusetts Medical Society and the Homeopathic Medical Society should be satisfied, in the first instance, that the principles of health insurance could be wisely and effectively applied to this state, it is then imperative that any movement looking to the establishment of the principle should be very largely in the hands of those who have got to carry on the work, taking such other advice from sociologists, employers, and others interested in the problem as might be necessary.

I believe, in closing, that the fundamental difficulty with health insurance as it has thus far been discussed in this vicinity is the old principle of taxation without representation.

DISCUSSION OF HEALTH INSURANCE.

Dr. James S. Stone, Boston: Health Insurance is a subject so complex and one of which I know so little, that I want much more to listen than to talk. But we must inform ourselves, and the issues brought up must be met fairly and in a very broad-minded way. The medical profession is vitally concerned with a right solution of the problems and we might as well realize at once that no legislature will consider the personal selfish interests of physicians if convinced that health insurance legislation will benefit the community at large.

Within a few days Dr. Cotton has brought forward the suggestion that the answer to the medical problem is the abolition of the problem. He suggests that the proposal to furnish medical care as part of the insurance benefits be eliminated and goes on to say:

"The move purports to be one for insurance of the workman; not for the regulation or ruination of medical practice in this Commonwealth. Let it be an insurance measure pure and simple.

The proposals to let John Doe, sick and off the job, have half, two-thirds, or three quarters of his wages, while he is out, sounds well; is probably wise, and is very likely entirely feasible. But that is no reason why Richard Doe, M.D., should be forcibly legislated out of his habits and routine, out of his dignity, as he conceives it, and very likely out of half his living as well; more particularly as he has not asked for any change or merited any regulation, so far as we know."

In considering this suggestion of Dr. Cotton's, it is important to realize exactly what he proposes. In reality he suggests unemployment insurance in place of health insurance.

Now to keep the issues clear, when we think of health insurance let us call it health insurance, and when we think of unemployment insurance let us call it that. But let us recognize too that insurance against unemployment due to illness must inevitably sooner or later involve the medical profession. When fire insurance was first undertaken the rates were equal for all. There immediately followed the differentiation into classes of risks, and there is a constantly increasing effort in the direction of preventive measures. Similar results must inevitably follow unemployment insurance. Medical inspectors must inevitably be appointed at first to prevent fraud and very soon to report on whether the sick workman is getting well as surely and quickly as is possible. Other obvious steps will follow. The medical problems cannot be divorced from the problems of unemployment insurance. I do not mean by this that it may not be better to have the laws governing health insurance enacted as a natural result of conditions arising year after year, rather than to attempt to enact a complete piece of legislation at the beginning. These are two different methods of meeting a most difficult and complex set of problems. But it is a great error to feel that we can avoid being involved by declining to take part in the settlement of problems which hinge upon preventive medicine.

Many progressive employers are beginning to realize the economic value of keeping their employees healthy. They are employing physicians and nurses to care for the slightest injuries at once, and to insure rest and care for those even slightly ill.

In the same way the school physicians and nurses are doing much to insure care of the children at the very onset of their illness.

Unemployment insurance alone will do much to provide good care and sufficient food for the children whose fathers are sick. It may be best to insist that if social legislation is to be enacted at all it should be simply unemployment insurance at first; and that the medical aspects be left for later consideration. But if so, let us do it with the full understanding that the medical problems will arise immediately and cannot be avoided.

Those of us who are interested in hospitals must realize the possible effects upon gifts and legacies which may follow taxation to care for the sick.

The problems are most complex. They cannot be avoided. We have started along the road of preventive medicine. The medical profession must point out the best ways in which the aims of preventive medicine can be fostered, or else be content with such legislation as is forced upon us by the legislature seeking the good of the commonwealth.

Dr. Emmons: Infant mortality during the first month of life, when prenatal causes are active, amounts to about 40% of the total. This mortality has been shown by the United States Children's Bureau investigations to be rising rather than falling. To one working in the poorer districts of the city, this fact is not surprising.

I ask you, gentlemen, if the medical profession is doing anything to improve this situation and whether some change is not desirable?

I favor the principles of health insurance because I believe that with organized care to carry out the object, maternity benefits would in time result, and that such organized care should improve the situation and give us some system for steady improvement in our results of maternity work.

Book Reviews.

Diseases of the Genito-Urinary Organs and the Kidneys. By Robert H. Greene, M.D., Professor of Genito-Urinary Surgery at Fordham University, New York; and Harlow Brooks, M.D., Professor of Clinical Medicine, University and Bellevue Hospital Medical College. Fourth edition, thoroughly revised. Octavo, 666 pages, 301 illustrations. Philadelphia and London: W. B. Saunders Company. 1917.

The publication of the fourth edition of this book has been demanded, not so much because of material changes in the subject-matter, as because of the popularity of the preceding editions. The present book is practically identical with the previous (third) edition, which was reviewed in this Journal three years ago. It is a trustworthy, comprehensive text-book, which has stood the test of time, and has enjoyed the popularity which its previous editions have merited, and which the present edition will undoubtedly command.

Abnormalities of Myocardial Function. By T. Stuart Hart, M.D. New York: The Rebman Company. 1917.

Dr. Hart has written an excellent book of three hundred pages based almost exclusively on the newer graphic methods. Nevertheless, the book meets admirably the needs of the student and practitioner who want to know modern medicine in the light of new advances and yet have not the opportunity themselves to utilize these instruments of precision. It is a well-written book, lucid and direct, with a minimum of unnecessary material.

An Introduction to Neurology. By C. Judson Herrick, Professor of Neurology in the University of Chicago. Philadelphia and London: W. B. Saunders Co. 1917.

This little volume is called an introduction to neurology, but the reviewer, in going through the volume, is continually amazed to find the amount of exact information contained in it, and only closer study shows that this has been attained by the most careful condensation in which it seems that no important fact has been omitted, and no unimportant ones allowed to take space required for the essentials. On almost every page we see the evidence of the work, not only of a careful student, but of an expert, not only in his field, but in teaching.

Especially to be commended is the avoidance of the error of going in too great detail into the course of tracts of fibres, perhaps well known anatomically, but the function of which still remains unknown to us, and the amount of space given to making clear to the student the fundamental physiologic principles of action of the complicated structures of the nervous system.

Taken as a whole, we know of no book better fitted to serve as an introduction to serious study of this fascinating but difficult branch of knowledge.

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MEDICAL EXAMINATION OF RECRUITS.

In the present issue of the Journal are published four articles of especial interest in relation to the medical examination of recruits. The general physical examination of soldiers involves several special points of importance, differing from similar examination in civil practice, especially on account of the liability to malingering in a draft army.

On page 232 appears a report of an address by Major Brownlee, outlining the general methods and technic to be pursued in examining recruits. Following this is a report recently submitted to the Surgeon-General of the army by the committee on clinical methods and standardization of examinations and reports, which is a sub-committee of the Mental Hygiene War Work Committee of the National Committee for Mental Hygiene. The latter, as is well known, has been authorized by the Surgeon-General to organize and equip neuro-psychiatric hospital units, to be attached to the base and other military government hospitals. This report represents the first attempt ever made in organizing an army to take into consideration the neuro-psychiatric qualifications of the men. It has been accepted by the surgeon-general, and is to be used as the basis of an official circular from his department.

On page 236 of this issue of the Journal is published further a letter dealing with the latest modifications of the plan of the medical department in dealing with the detection of tuberculosis among recruits for the National Army. This modification involves some departure in detail from the plan originally outlined editorially in the issue of the Journal for July 5 (page 19) and amplified in succeeding numbers. Finally, on page 213 is published a paper by Dr. Richards, dealing with the special methods and tests applicable to the determination of deficiency in hearing, especially the detection of malingering, as applied to army physical examinations.

A perusal of these four papers should be of value to general practitioners about to undertake in any capacity the examination of recruits for military or naval service. It is hoped that other papers of a similar nature, dealing with special aspects of the problems involved, may appear in subsequent issues of the Journal.

PAUCITY OF MEDICAL RESERVE OFFICERS.

The Massachusetts State Committee for National Defense has received from the National Council the surprising statement that out of 5869 doctors in the state, only 279 have been recommended for the Medical Officers' Reserve Corps; that is to say that only 5%, apparently, of the Massachusetts physicians have offered their services to the country in the existing crisis! These figures are so surprisingly small that it seemed at first as if an error must have been made, but upon careful consideration of existing data we find that these figures are substantially correct. The State Committee for National Defense therefore makes, through the pages of the Boston Medical and Surgical Journal, a most urgent appeal to the physicians of Massachusetts immediately to make application for an appointment in the Medical Officers' Reserve Corps, or for an appointment to the regular Medical Corps, either the army or the navy.

It is particularly important that young men who have recently finished hospital appointments should volunteer directly. As is well known, any healthy man of less than fifty-five years, particularly those men who are without dependents, will be welcomed, as they are very greatly needed under existing conditions. Applications cannot possibly be made too soon, since it requires three or four weeks to receive a commission after application has been made.

It is also probable that a considerable number of doctors have been examined for the Medical Reserve Corps and have received their commissions, but have not accepted them. It is more than ever essential that the men should accept their commissions immediately, as their services are not available to the country until they have formally accepted the rank given them.

John Bapst Blake, *Chairman,*
Massachusetts State Committee
For National Defense.

INDUSTRIAL HEALTH INSURANCE.

The attention of members of the Massachusetts Medical Society, and of other readers, is particularly directed to the report of notes taken by the Society's committee at a recent conference on social insurance, published on page 229 of this issue of the Journal. It is also directed to the remarks on health insurance by Drs. Broughton, Stone, and Emmons, reported on page 225 of this issue, in the proceedings of the New England Pediatric Society.

MEDICAL NOTES.

Insanity Statistics.—*Mental Hygiene* has published in a current issue statistics regarding the increase of insanity in the United States, which go far to correct the popular supposition that insanity is increasing in this country to an alarming extent. From 1910 to 1917 the population increased 11.80%, and during this period the rate of increase of the insane in institutions for insanity was 24%. The rate of increase of the insane in our institutions since 1904 has been more than three times as rapid as it was during the fourteen years preceding 1904, but there has been no acceleration of the rate during the past seven years. Various conditions have worked, however, to increase the number of insane treated in institutions.

Gift to University of California.—The University of California has received from Dr. T. Brailsford Robertson, professor of biochemistry and pharmacology, his patents for the growth-controlling substance, tethelin, isolated by him from the anterior lobe of the pituitary body. Should there be an income from the sale or lease of these patents, such income is to be used to establish a fund known as "The University of California Foundation for International Medical Research," to be expended in research in the physiology, chemistry and pathology of growth.

WAR NOTES.

Mental Hygiene War Work Committee.—The Mental Hygiene War Work Committee of the National Committee for Mental Hygiene is anxious to obtain the names of psychiatrists and neurologists who are willing to give part-time service in the examination of National Guard troops in their vicinity. The recent decision of the War Department to examine the National Guard troops in their armories before sending them to camp, makes it necessary to secure at once a large number of examining physicians. To meet the situation, the Surgeon-General of the Army has arranged to accept for this work qualified physicians on contract. A physician may contract for specified duty, at a specified place, for a specified time, or for part-time. This latter provision makes it possible for many physicians who cannot take out commissions, or who cannot give all of their time to the work for a period of months, to give part-time each week. Further information can be received from Dr. Frankwood E. Williams, vice-chairman of the committee, 50 Union Square, New York City.

War Relief Funds.—On Aug. 11 the totals of the principal New England war relief funds reached the following amounts:—

French Wounded Fund	$245,657.12
Armenian Fund	213,436.70
Surgical Dressings Fund	114,974.01
British Imperial Fund	105,046.00
Serbian Hospitals Fund	100,486.82
Boston Red Cross Fund	78,307.87
Polish Fund	76,906.18
French Phthisis Fund	68,333.33
Italian Fund	43,749.72

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—The total number of deaths reported for the week ending August 4, 1917, was 249, against 202 the corresponding week last year, making a death rate of 16.81, against 13.85 last year.

The number of cases of communicable diseases reported was: diphtheria, 41; scarlet fever, 12; typhoid fever, 3; measles, 43; tuberculosis, 63.

Included in the above were the following nonresident cases: diphtheria, 7; scarlet fever, 2; typhoid fever, 1; tuberculosis, 6.

The number of deaths was: diphtheria, 2; measles, 2; tuberculosis, 22.

Included in these were the following non-residents: tuberculosis, 2.

The Blind in Massachusetts.—The Massachusetts Commission for the Blind, which has been in existence for ten years, has arranged and printed in pamphlet form a survey of its work for that period. This was done with the idea of making the best possible use of the experience of the Commission for this period of time, both for future work of the State and for any help it may yield to other communities. The six men (three of whom were blind) invited to make this survey, were asked, not only because they were educators of the young blind, but because of their experience with the adult blind, three having served on State commissions. Their reports are printed in the following order: O. H. Burritt, principal of the Pennsylvania Institution for the Instruction of the Blind at Overbrook, Pa., discusses the organization of the Commission; J. J. Dow, superintendent of the Minnesota State School for the Blind, Faribault, Minn., reviews matters of record and report; Edward M. Van Cleve, principal of the New York Institute for the Education of the Blind, discusses the blind in the community; E. P. Morford, superintendent Brooklyn Industrial Home for the Blind, writes on the industrial home for the blind; and R. B. Irwin, of the board of education, Cleveland, Ohio, writes on the relation of the Commission to other agencies. As a document full of suggestions and information in this most important branch of social work, this pamphlet is of much value.

The Massachusetts Medical Society.

NOTES TAKEN AT CONFERENCE OF THE SPECIAL COMMITTEE ON SOCIAL INSURANCE, AT THE STATE HOUSE, AUGUST 1, 1917.

(After 11.30.)

Dr. W. P. Bowers and Mr. M. W. Alexander of the General Electric Company were present.

Dr. W. P. Bowers stated that he did not believe that at present there were sufficient data anywhere to answer the questions as regarding the need of health insurance, its cost, or the proper method of administration, and that he did not personally believe that this was the time for legislation, but if legislation was demanded he would propose a measure of partial insurance, by which in several years the community would be in possession of the necessary data with which to draw up a complete bill or to reject the proposition entirely.

This proposition he presented the Committee, and it will later appear in the columns of the Boston Medical and Surgical Journal.

The following questions were asked Dr. Bowers:

1. This question has been worked over in the legislature for seven, eight, nine, or ten years; how soon do you think it will be in form so a bill might be safely put?

2. Senator Washburn: Isn't there some phase of this proposition small enough so that something might be drawn up in the way of a bill which might mark progress?

(Senator Washburn had just come in, and did not know that Dr. Bowers had already covered this.)

3. Chairman: Would it be asking too much if you would outline your plan in writing and submit it within a reasonable time? Within two months would probably be satisfactory.

The following were asked Mr. Alexander, whose statement to the Committee can be found in his pamphlet, "Some Vital Facts and Considerations in Respect to Compulsory Health Insurance," March, 1917.

4. Have your employees an insurance company?

Answer: Mutual benefit insurance. This does not cover all the employees; takes in some 8000 people at the Lynn works. Statistics based on that show that the sickness rate is lower than some of the investigations show, and almost coincide with the report of the Metropolitan Insurance Company.

The proponents of health insurance base their arguments on the statements that the death rate is excessive, that the sickness rate is very high, and that the wage poverty is so great that the average man cannot afford to secure medical care. These points have not been proved by the proponents.

5. You spoke of there being a mutual benefit organization; is this voluntary on the part of the employees?

Answer: Absolutely.

6. Do you, or do you not, find that the employees who really need it the most, take advantage of it, or don't pay any attention to it?

Answer: The employees who need it most constitute a majority of the members except as far as the foreigners are concerned. Ninety per cent. of the workers in the foundries are foreigners, of no education; suspicion is very great among them, and they don't know English enough to understand the objects of the mutual benefit scheme. Most of the Americans are in it all right.

The idea is to have the employees themselves carry the insurance; the employer has nothing to do with it, except administrative supervision. We want the employees to do their own business; are trying to build up an industrial democracy—of themselves, by themselves, and for themselves. It is purely an employees' mutual benefit association.

7. Then a good way would be to educate the illiterate foreigners?

Answer: They change so rapidly that it is difficult to educate them.

Mr. Alexander: In approaching this problem, I would say that I would like to see the appointment of a national commission of eminent and competent persons, who would make a study of this subject. It should not be bound by state boundaries; it ought to be studied from a national standpoint.

Secondly, a strenuous effort should be made to take our Public Health Service and enlarge its powers, if necessary, putting in better talent if necessary, and have it get after sickness and death, and become familiar with every case that occurs, with a view to taking steps to prevent sickness, as far as it can be prevented. That is one of my dreams. I would like to see every man and woman examined at least once a year, or twice a year, by a public authority, free of charge, or, if preferred, by a private medical authority approved for this purpose. Then the state or nation would know what the development is, and could counteract incipient sickness. Instead of spending 25 or 50 millions for compensating people when they are sick, I think a million will do 25 or 50 times more good if spent in studying the health condition of the people and in going after incipient cases before they go beyond proper control.

We must not deal with men as industrial workers, or as agricultural workers, but as men and women of the community. It is a wrong conception that we should legislate for any part of the community in a question like that. It is the whole people that are entitled to the protection of the commonwealth.

8. Senator Washburn: Would you say that everybody should be examined at the expense of the state where his financial resources are below a certain plane, and at his own expense where they are above that plane? And that he should be examined twice a year?

Is that about as far as your mind has got in the way of any legislation?

Answer: Everybody should be entitled to free examination, unless he prefers to pay for it by employing a private authorized physician.

9. Senator Washburn: You spoke about the dangers of coddling: that a man might be in a position to go to work but it would give him a good chance to stay at home and be remunerated. What is going to be the effect on the people psychologically in bringing them into closer touch with the medical profession? I mean it seriously. My proposition is: Is it a fair statement, that many a man would be in better health today if he hadn't seen a medical man than if he had seen one? Cutting out the undesirable doctor,—I didn't know there were any,—isn't there many and many a man who would be in better health today if he hadn't seen even the best physician?

10. Senator Washburn: You think that is infinitesimal (referring to Question 9). Do you think from your study of these medical propositions, that life is longer today than it was 50 years ago? Do you think the length of life is keeping step with the advance of medical science?

11. Senator Washburn: Your mind is very clear that you would like to see a preventive measure drawn up, and only wish the investigation continued? You mean, drawn up with the idea of perfecting a preventive bill? What sort of legislation would you like to see started?

12. Senator Washburn: Do you think the wage-earner is living better today than he was 20 years ago?

Answer: I think he is living better but less sensibly.

13. What do you think about the proposition given by Dr. Bowers this morning?

Answer: I think it a very ingenious and clever (in the right meaning of the word "clever") idea, and I am going to think it over. But I think that will have to be a second step and not a first step.

14. Mr. Morss: What do your people pay in that mutual benefit association, and what do they get?

Answer: Every man pays ten cents a week, maximum. They can never be assessed. And he pays ten cents a week only when it is needed,—when the treasury is pulled down. The average is $4 a year, or eight cents a week.

He gets for it $6 a week sickness benefit from the second week of sickness, and for a period of 14 weeks in a year; $100 death benefit; extra benefit to any amount or in any form voted by the association, for instance, a ton of coal, $20 a week extra, the services of an eminent surgeon, or $2 a week for an indefinite period; and he has a right to apply for a small loan, limited to $50 (in one instance, $100), if he can show to a committee of three that he is in need of the money to keep out of the hands of loan sharks. In the repayment, he pays neither fees, extras, or interest money; and the benefit association has never lost a cent.

15. Mr. Morss: Those benefits being administered by the men themselves, how much real difficulty do they have from malingering?

Answer: Less difficulty than if insured by the employer. It is a federation of small sections, none having more than 150 members, all located in one department or one building, and each member knows all the other members; each section collects its own dues and pays its own bills.

16. Do they choose their own physician?

Answer: Yes. We don't pay the physician; merely have occasionally a high-class physician to check the claim.

(The new hospital is for first aid and accident cases only.)

17. You examine your men before taking them on? You don't examine them after they are taken on?

18. Senator Washburn: Do you think that we have data enough today by which we could draw up a wise preventive bill?

19. Do you feel that at the present time there is any need of this health insurance? Any public demand for it?

Answer: I think there is no great need and no great demand for it. There is an apparently loud demand, and it is voiced by people whose heart rather than head speaks in the proposition. They don't know the situation.

20. Representative Brogna: Do I understand that you are convinced that some form of social insurance is bound to come in this country?. . . Do you base that upon the opinion that as we go along, we shall be worse off, or because there is a need and we have no statistics of the need?

Answer: Because I think there is a certain amount of sickness which cannot be checked in people unable to secure care for themselves, and somebody must take care of them.

21. Representative Brogna: Then your position is that, because of the mode of living at the present time, or the senseless mode of living, we are going to be in a worse position 10 or 15 years from now than at the present time?

Answer: I believe we shall have a larger percentage of sickness in 15 years from now than we have now, if we don't now deal with the question of preventive medicine.

22. Your opinion is that if a sufficiently broad proposition of preventive medicine is adopted throughout the country, that will forestall any social insurance scheme such as is now under consideration?

23. At the present time, you think there is no great need of health insurance?

Answer: I think there is no need for the enactment of a law that will involve much money and cause bad social tendencies, just because there are some men who cannot take care of themselves.

24. Senator Washburn: I would like to ask whether the weight of the enthusiasm of some manufacturers that this should be solved by a preventive bill rather than social insurance, is poisoned by any desire to save their own pocketbooks?

. . . Supposing you were on this committee and heard the charms of a preventive bill from the mouth of a representative of a large industrial plant, would you drink it in?. . . Not because he is a lawyer, but because he is enjoying a retainer from a large company?

Answer: I might be suspicious, but I believe that a good many manufacturers, without knowledge of the facts of the situation, would be more apt to shout for a compulsory, contributory health proposition than for a preventive medical proposition, because the very word *compulsory* attracts them.

25. Senator McLaughlin: What do you think of the possibilities of passing through the legislature a law requiring a physical examination of the people? Last year we had the "incorrigible consumptive" bill, under which the board would be allowed to walk into a man's home and have him put into a "detention camp" or some such place. What do you think of passing through the legislature a bill that a man must submit himself to an examination twice a year?

26. Senator Collins: Do you suppose that if every employer of labor compelled a physical examination of his employees, it would remove such a large percentage of danger that it would get the bill through?. . . It is probably a matter of the education of the people.

27. Representative Brogna: (In answer to Mr. Alexander's statement that only 50 out of 17,950 who had applied for work had refused to submit to physical examination): Those men were looking for a job, and they have to stand a lot of indignity from employers when they are looking for employment; but supposing I, working for myself, were asked to be examined twice a year, wouldn't I say it's nobody's business but my own, and change my mind about this democratic government that compelled me to do this?

Mr. Alexander replied that now the company were more anxious to get employees than the men were to get work.

28. Senator McLaughlin: Would you be in favor of passing that compulsory physical test, providing a great minority of people rose up and opposed it? I have in mind a great many people who might think it an infringement on their beliefs. . . There is a great sect in this town, influential, intelligent people, who would oppose such a plan. They would believe it a direct trespass on their rights spiritually.

(Mr. Alexander thought they could probably be convinced; that they were not a majority or a large minority; a special class, but far from being a large minority.)

29. Senator Washburn: Wouldn't such a bill be unconstitutional if it interfered with their religion?

30. Isn't it a fact, that the fellow who doesn't want to be examined is the one who ought to be examined? The fellow who is all right has nothing to worry about.

31. Would they be examined by physicians paid by the state or by the employer?

32. Has your concern or any other had any friction with labor organizations because of the examination? Can you conceive of the possibility of putting one over on the labor unions?

NOTES FROM THE DISTRICT SOCIETIES.

Worcester District Medical Society.—This Society, in special meeting assembled, Aug. 1, 1917, declared its opinion:

First, That its members attending patients of Fellows absent in military service of the United States, or its Allies, are in honor bound to turn over to the authorized representatives of such absentees, one-third (at least) of fees collected from such patients, provided always that the absentee is willing to accept this service.

Second, That the Society also declares its opinion that its Fellows, thus practicing, *in loco absentis,* should decline to attend former patients of the absentee for a period of six months after his return, unless by his express consent.

Third, The Society authorizes its Secretary to furnish, to each Fellow, a placard for posting in his office, embodying this declaration of policy, as approved by the Society, and an invitation to patients of such absentees to assist in the application of this policy, by declaring themselves as such patients.

Fourth, That the Society elect a War Committee, consisting of five members, of which the President shall be chairman, *ex officio,* and the rest appointed by him for one year's service, at least; and the Society requests every practitioner entering military service to notify this committee of his action, and to specify whether or not he wishes to avail himself of the provisions of the above policy. This committee shall keep a list of such absentees and shall publish with the notices of regular meetings of the Society, such additions as come to their knowledge. The committee shall, as the agent of the Society, protect, in all practicable ways, the interests of absentees on military service, and may therefore devise and promulgate to the Society membership such rules and regulations as are, in its opinion, necessary to guide members in practical application of these policies. The committee shall act as referee in all cases that may be referred to them when the home-physician or the representative of the absentee is in doubt as to proper procedure.

Fifth, That the Society invites all registered physicians in this District, whether affiliated with this Society or not, to full and cordial coöperation in carrying out the letter and spirit of these policies; and the Society instructs its War Committee to use such means as it finds practicable to secure this desired coöperation.

Sixth, That the Society, through its War Committee, coöperate with the War Relief Committee of the Worcester Red Cross Chapter in the medical care of dependents of men enlisted from this district.

The War Committee is: Dr. Michael F. Fallon, *Chairman;* Samuel B. Woodward, W. J. Delahanty, George O. Ward, *Secretary;* Ernest L. Hunt.

Miscellany.

GENERAL MEDICAL EXAMINATION OF RECRUITS.

The following is a report of an address by Major Charles Y. Brownlee, of the United States Army Medical Corps, before a recent meeting of members of the medical examination boards of Brooklyn and Queens Counties, New York.

"In general, you must remember that a soldier is forced to undergo trials and hardships which men in civil life are seldom called upon to face. Therefore, a generally robust physique is essential if we are not to have an army of weaklings, increasing the sick report, filling the hospitals, entailing extra burdens on an already overworked medical department, and, by depleting an army at a critical period, inviting disaster.

"We in the Regular Army and in the National Guard have had to deal with men who voluntarily applied for enlistment, so we have had to be on the alert to detect concealed disabilities, and have had almost no malingering to deal with at this stage.

"You, gentlemen, will, no doubt, find many 'slackers,' who for various reasons will malinger or grossly exaggerate the effects of some trifling disease or injury.

"Now, as to appliances, etc., needed. First, if possible, have a well-lighted room, at least over 20 feet in length, convenient to a shower bath, if possible, in order to subject those requiring it, to a thorough cleansing bath.

"Scales—A scales such as are supplied by instrument houses, with measuring rod, is not essential. In fact, I have found that the rod often becomes loose and quite inaccurate. Ordinary grocer's platform scales, if in good condition, are quite satisfactory and quite accurate. Height measurements may be taken by marking off on a wall from a steel tape heights from 60 to 78 inches in $\frac{1}{4}$ inches, the inch marks to be longer than the quarters and marked with the height. By using a ruler or any flat, straight object, the height is obtained more accurately and quickly than by the ordinary rod and headpiece.

"Other essentials are a vision test card, tape measure, watch, stethoscope, head mirror, tongue depressors and aural specula. Also a spirit lamp, a few test tubes, acetic or nitric acid and Fehling's solution for those cases requiring a urinary analysis.

"A sphygmomanometer and microscope are occasionally needed, as is an ophthalmoscope. You have been furnished the regulations governing physical examinations, but perhaps a few additional remarks would not be amiss.

"You will more than double the number you can examine in a day by having an intelligent clerk to record your findings as you call them out. Record every physical defect found, whether it disables or not.

"Your table of height and weight gives a minimum of 60 inches and a weight of 118 pounds with eight pounds' variation, thus making a minimum weight of 110 pounds. Needless to say, at this height and weight, the man should be nearly perfect otherwise, and active, vigorous, well-proportioned and muscled.

"Reject the long, willowy, pale, narrow-chested youth, far below weight for his height, and the man of general poor physique, say, such a one of 70 inches and 125 pounds. As to methods of detecting malingerers, particularly in regard to vision and hearing, for obvious reasons, these should not be published, but remember your ophthalmoscope.

"Hernia disqualifies, but it must be an actual hernia, not simply a relaxed inguinal ring, as a very large proportion of relaxed rings never cause hernia.

"Of course, general diseases, such as chronic malarial poisoning with grave anemia or enlarged spleen, tuberculosis in any form, recurrent and chronic rheumatism, malignant tumors, syphilis, also cystitis, etc., are all causes for rejection. As to flat feet, your instructions are so concise that nothing more need be said.

"Mental and Nervous Diseases—Look out for those of defective mental development. They are only a nuisance in the Army. Of course, all forms of insanity are cause for rejection, as is epilepsy and severe chorea. In regard to the man who states he is subject to fits, have him procure a statement to that effect in writing from his family physician, that he has treated him for that disease prior to the passage of the Conscription law. Use the same procedure in regard to other diseases not readily discovered in a brief examination, such as bed wetting, recurrent abdominal pains, gallstones, nephritic colic, etc.

"As to the lungs, of course, you will be on the lookout for tuberculosis. In the great majority of cases there are such suspicious signs as will cause you to be particularly careful. In this disease, it is not only the subsequent disablement of the man himself that is to be considered, but the menace he will be to the health of his comrades.

"The Heart—Functional murmurs at the apex are extremely common in youth and young manhood. At times it is difficult to determine whether a murmur is functional or organic, but a murmur without secondary symptoms such as hypertrophy, irregularity or dyspnea may safely be classed as functional.

"Pronounced and persistent tachycardia from any cause rejects. Varicose veins, if quite large and prominent and over a large area, especially if associated with edema or ulcers, disqualify.

"Curvature of the spine, not interfering with functions and not easily detected with the clothing on, is not cause for rejection.

"The Extremities—Look particularly for ankylosis of elbow and chronic synovitis of the knee, the latter furnishing a large number of cases for discharge on certificate of disability in the Army. Total loss of either thumb or more than one joint of the right index finger, loss of either great toe, hallux valgus, if marked, severe bunions, marked hammer toes,—are all causes for rejection.

"I have mentioned a few of the more common disabilities which you will meet. Your medical knowledge will determine your course of action in the multitude of other conditions met. With an efficient clerk, after the first day, one physician can easily examine 100 men a day."

REPORT OF COMMITTEE ON CLINICAL METHODS AND STANDARDIZATION OF EXAMINATIONS.

To the Psychiatrists and Neurologists Assigned to Special Duty in the Military Camps of the United States Government.

In detailing psychiatrists and neurologists to special duty with the armies, the Surgeon-General has had in mind: (1) The proper care and treatment of soldiers who become incapacitated through mental or nervous disease. (2) The special examination of recruits in the training camps in order that those who, because of neuropathic or psychopathic conditions, are unfit for military duty, may be identified and discharged from service.

Until the troops move abroad, the chief and most important responsibility of the military psychiatrists and neurologists will be the special examination of recruits. It is obvious that no man should be eliminated from the service who is fit to render a valuable service in this emergency. On the other hand, it is quite apparent that individuals suffering from certain forms of nervous and mental diseases should not be permitted to enter into service, as experience with the American armies has shown quite conclusively that such individuals are not capable of military service even in time of peace, and experience in the European armies has shown beyond question that such individuals are not able to withstand the rigors of modern warfare. At critical times such individuals go to pieces, with the result that the military force is weakened, is hampered in the free performance of its function, and the Government is likely to be burdened after the war with the care of a large number of invalids.

At the request of the Surgeon-General, the question of those who should be excluded from the military services on account of mental and nervous disease, has been carefully studied, and with the approval of the Surgeon General we would suggest that the following general outline be followed in determining this matter. It is important that the potential as well as the actual conditions of the recruit be kept in mind. For this reason emphasis has been laid upon the early symptoms of disease. Likewise, attention has been called particularly to those diseases which are most likely to be met and which have not very obvious symptoms but which, nevertheless, can be diagnosticated relatively easily and with considerable certainty. It is not to be assumed that other neuropathic and psychopathic conditions, when found, are not cause for exclusion. Most of these, however, such as multiple neuritis, various forms of paralysis, hemiplegia, cranial nerve palsies, and peripheral neuritis, have such striking symptoms that they are likely to be recognized before they come to the attention of the neurologists and psychiatrists.

Recruits to be Excluded.

I. NERVOUS DISEASES.

(*a*) *On the Basis of Disease.*

1. Tabes. (Look for Argyll-Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)
2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremors.)
3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; scars on forearm and fingers caused by burning; deformities of feet.
4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)
5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(*b*) *On the Basis of Symptoms or Combination of Symptoms or History.*

1. Unequal pupils, irregular pupils, Argyll-Robertson pupils.
2. Nystagmus (in one not an albino), absent abdominal reflexes, intention tremor.
3. Absent knee jerks associated with some one other organic neurologic symptom.
4. Exaggerated tendon jerks, Babinski.
5. Disorders of station or gait.
6. Disorders of speech (on test phrases), facial tremor, one other organic neurologic symptom. (Stammering and stuttering *per se* are not significant of an organic neurologic condition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)
7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

II. MENTAL DISEASES.

(*a*) *On the Basis of Disease.*

1. General paralysis. (Look for Argyll-Robertson pupils, speech defect consisting of distortion of words, writing defect, consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.
2. Dementia precox. (Look for indifference, ideas of reference, feelings of the mind being tampered with (*e.g.,* ideas of hypnotism) auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)
3. Manic-depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and overactivity.)

(*b*) *On the Basis of Symptoms or Combination of Symptoms or History.*

1. History of previous mental illness. (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated, or by what physician he was attended; this information to be verified by letter.)

III. PSYCHONEUROSES AND PSYCHOPATHIC CHARACTERS.

(Look for phobias, morbid doubts and fears, anxiety attacks, fatiguability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.)

IV. CHRONIC ALCOHOLISM.

(Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrane of the pharynx and of the soft palate; also ashen complexion and clammy skin; muscular tremor in the protruded tongue and extended fingers,—noticeable also in lack of control when the applicant attempts to sign his name; emotionalism, prevarication, suspicion; auditory or visual hallucinations, paranoid ideas.)

V. MENTAL DEFICIENCY.

(Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoordination. Consult psychometric findings.)

VI. DRUG ADDICTION.

(Look for pallor, dryness of skin; flippancy, mild exhilaration—if under the influence; cowardly, cringing attitude, restlessness, anxiety—if without the drug: distortion of the alae nasi; contracted pupils—morphine—or dilated pupils—cocaine; dirty deposit at junction of gums and teeth; bluish and whitish needle scars on thighs and arms.)

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.
Thomas W. Salmon, M.D., Medical Director, the National Committee for Mental Hygiene, New York.
Adolf Meyer, M. D., Director, Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore, Md.
Pearce Bailey, M.D., Chief of Clinic, N. Y. Neurological Institute, New York.
E. E. Southard, M.D., Director, Psychopathic Hospital, Boston, Mass.
Joseph Collins, M.D., N. Y. Neurological Institute, New York.
Albert M. Barrett, M.D., Director, State Psychopathic Hospital, Ann Arbor, Mich.
T. H. Weisenburg, M.D., President, American Neurological Association, Philadelphia.
William A. White, M.D., Superintendent, Government Hospital for the Insane, Washington, D. C.
Robert M. Yerkes, Ph.D., Professor of Comparative Psychology, Harvard University, Cambridge, Mass.
Walter E. Fernald, M.D., Massachusetts School for the Feeble-minded, Waverley, Mass.

Major-General W. C. Gorgas,
Surgeon-General, U. S. Army,
Washington, D. C.

Sir:

In view of the fact that it will be necessary for the psychiatrists who are assigned to the various military camps to examine a large number of recruits in a brief space of time, it is felt by the undersigned that this work can be greatly expedited if the assistance of camp surgeons and line officers can be obtained in selecting from those who come under their observation, individuals likely to need neuro-psychiatric examination. This can be easily done if the medical officers, dental surgeons and line officers will keep certain fundamental things in mind. We would suggest, therefore, the following:

(1) That, in view of the importance of syphilis and hyperthyroidism in neuro-psychiatric conditions, all persons suffering from either of these diseases observed by the surgeons in the ordinary course of their work, be referred to the psychiatrist for further examination; and

(2) That the personality traits named below are of such importance as indicative of possible underlying mental conditions, that line officers be instructed to refer to the psychiatrist recruits under their observation who exhibit them. These traits are: Irritability, seclusive, sulky, depressed, shy, timid, over-boisterous, sleepless, persistent violators of discipline, "queer sticks," cranks, "goats"—butts of practical jokes, "boobs"—those who have difficulty in comprehending orders—dull, stupid, marked emotional reaction (such as vomiting and fainting) at bayonet drill, peculiarities of attitude, speech or behavior sufficiently marked to attract attention of associates, those resentful of discipline, suspicious, sleep-walkers, bed-wetters, those persistently slovenly in dress, those who have difficulty in executing muscular movements in setting up exercises.

Very truly yours,

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.
Thomas W. Salmon, M.D., Medical Director, The National Committee for Mental Hygiene, New York.
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Walter E. Fernald, M.D., Massachusetts School for the Feeble-minded, Waverley, Mass.

Major-General W. C. Gorgas,
Surgeon-General, U. S. Army,
Washington, D. C.

Sir:

It is the belief of the undersigned that the neuro-psychiatric examination of a large number of recruits would be expedited if permission were granted to the psychiatrists in the various camps to train and utilize hospital sergeants or others who might be chosen by the psychiatrist, to make group examinations of recruits for the following conditions: Pupillary changes,—unequal, irregular, disorders of reaction,—absent or increased knee jerks, station and gait disorders, marked tremors (extended fingers), facial tremor on showing teeth.

Recruits found by the examining sergeant to exhibit any one of these symptoms should be referred to the psychiatrist for further and more intensive examination.

Very truly yours,

(Signed)

August Hoch, M.D., Director, Psychiatric Institute, Ward's Island, N. Y. C.

Thomas W. Salmon, M.D., Medical Director, The National Committee for Mental Hygiene, N. Y.

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Walter E. Fernald, M.D., Massachusetts School for the Feeble-minded, Waverley, Mass.

* * *

Correspondence.

EXAMINATION OF TROOPS FOR TUBERCULOSIS.

War Department, Office of the Surgeon-General,
Washington, July 30, 1917.

Mr. Editor: -

The Surgeon-General of the Army desires the fact to be known that since the publication of your excellent editorial entitled "Tuberculosis in the Army," in your issue of July 5th, 1917, there has been a change of policy, in that temporary commissions in the Medical Reserve Corps can no longer be promised to physicians who are willing to undertake the examination of troops for tuberculosis.

Additional officers are still urgently needed for the Medical Reserve Corps, and those qualified for the work can be used as tuberculosis examiners for at least four months from August 1st. But the accepting of a commission must be with the understanding that service is to be for the duration of the war, and candidates must be able to pass the required physical examination.

For temporary service, the physician is now engaged under contract for a definite kind of work, and, if desired, for a specified and limited period. Contract surgeons are not required to pass a physical examination, and there is no age limit. As their work will be of a purely professional nature and field service or exercise will not be required, any physician who is able to practice medicine under the conditions of civil life is physically acceptable.

It is unnecessary to point out the fact that this offer affords an opportunity, and probably the only opportunity, for the large number of physicians to render a valuable service, who ardently desire to do something for their country at this critical time, but who, by reason of age, physical infirmities, or professional engagements, are unable to accept a commission.

The invitation thus to act as Boards of Examiners in revision of the work of the regular examiners of recruits, is in itself a compliment to the civilian medical profession, and the selection of an internist for this work should be regarded as an honor.

The name under which he acquires the necessary military status and the compensation obtained, are surely secondary considerations for all who are actuated by patriotic motives. No greater service can be rendered the country by the medical profession than the elimination of the unfit from the Army, and tuberculosis is, as is well known, one of the most important causes of physical unfitness, while at the same time demanding special skill for its detection.

It is desired to examine thoroughly the soldiers of the National Guard and the National Army, when they are assembled at their cantonments in the autumn. A large number of expert examiners will be required for this work, so that all who are competent to undertake it, can undoubtedly be given employment.

Very sincerely,
G. E. Bushnell,
Colonel, Medical Corps.

* * *

RECENT DEATHS.

L. E. Russell, M.D., of Springfield, Ohio, died at his home in that city on August 2. He was sixty-six years old. Dr. Russell was a former president of the National Medical Association.

James Allen Nichols, M.D., a well known New York surgeon, died recently at his home in that city. Dr. Nichols was born at Crown Point, N. Y., in 1860, the son of Dr. Thomas Brainerd Nichols. He graduated from the University of Vermont and from the Long Island Medical College, receiving his degree in 1888. He was for a time professor of surgery in that institution, and later surgeon in the Women's Hospital in New York and professor of surgery in the Post-Graduate Hospital. He retired from practice eight years ago and devoted himself to medical jurisprudence. Dr. Nichols was a member of the County Medical Society, The New York Academy of Medicine, the Sons of the Revolution, the Society of the War of 1812 and of the Medical Jurisprudence Society. He is survived by his widow, one son and one daughter.

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APPOINTMENTS.

Dr. Milton H. Foster of the Public Health Service has been appointed physician at the immigration station, Boston Harbor, to take the place of Dr. M. Victor Safford.

Dr. Donald Currie of the Public Health Service, for some time stationed at the Hawaiian Islands, has been placed in charge of the immigration station, Boston Harbor, to relieve Dr. S. B. Grubbs. Dr. Currie is well known for his work on the treatment of leprosy.

Dr. Horace D. Arnold, of Boston, has been appointed chairman of the Council on Medical Education of the American Medical Association, succeeding Dr. Arthur Dean Bevan of Chicago.

The Boston Medical and Surgical Journal

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THE MEDICAL PROFESSION AND SOCIAL PROGRESS.

By Andrew F. Downing, M.D., Cambridge, Mass.

Long before the joy-bells announced to an impatient world that the nineteenth century had given up to Father Time the ghost of an honorable and altogether fruitful life, we had begun to hasten his declining years by paying shameless tribute to the promising youth and vigor of his successor. And now, with two decades of this long-heralded golden age, with which we then flirted, not yet gone, with peace on earth departed, and good will sorely tried, the sad memory of that hurried leave-taking, and still more hurried journey through this young and pampered age, comes to us with vain regret. No longer does the dance go on; no more is joy unconfined; and youth, now mindless of pleasure, for whom there was, and still is, "no sleep till morn," "has a rendezvous with Death at midnight in some flaming town." Satisfied now that what we called speed, and confused with progress, was merely vulgar prodigality, and convinced that only in our determination to secure now, if ever, justice for all, lies the hope of the future, we are making amends to a century that we thought decadent, by seeking the solution of a trying situation in the almost forgotten teachings of Lincoln.

Industrialism, grotesque from abnormal overgrowth, commercialism sunk to the low level of unbearable arrogance, wealth pursued until it blurred the vision, contempt of the toiling, unsuccessful multitudes by the pleasure-seeking, successful few,—were burdens which before the present war began, had grown too heavy for a world that hoped for heaven. In our own country people were money-mad, and upon the answer to the question, "How much money has he?" depended the joy with which a man was welcomed by his fellows, or the indifference with which he was scrapped in the heap of social neglect. Men talking loudly and cynically of our inefficiency and crudeness began to doubt the wisdom that created our Democracy. They held up for our emulation the wonderful efficiency of the German people, the social justice that was theirs, and the unerring judgment and paternal solicitude of the government that made all this possible. Then we enter the world war, in the words of our President, "in armed opposition to an irresponsible Government which has thrown aside all considerations of humanity and of right and is running amuck."

No wonder that we are amazed and ask if this wonderful efficiency *is* really efficiency; if this social justice *is* really justice; if, after all, with its many shortcomings and defects, this old abused and maligned democracy of ours *is* really the failure that our purveyors of pessimism and carriers of calamity would have us believe.

But as individuals we feel a sense of loneliness, a consciousness of some great change that has taken place. What this change is, Graham Wallas in his "Great Society" thus expresses: "During the last hundred years the external conditions of civilized life have been transformed by a series of inventions which have abolished the old limits to the creation of mechanical force, the carriage of men and goods, and communication by written and spoken words. One effect of this transformation is the general change of social scale. Men find themselves working and thinking and feeling in relation to an environment which both in its world-wide extension and its intimate connection with all sides of human existence is without precedent in the history of the world.''

It is a significant fact that Wallas, who in this book prophesied the present war, prefaces his first chapter with an extract from Woodrow Wilson's ''New Freedom.'' ''Yesterday and ever since history began, men were related to one another as individuals... To-day the every-day relationships of men are largely with great impersonal concerns, with organizations, not with other individual men. Now this is nothing short of a new social age, a new era of human relationship, a new stage-setting for the drama of life.'' And when we add to this a few sentences from that great document on human rights which he delivered at the joint session of the two Houses of Congress, April 2, 1917, we shall cease to be amazed and shall begin to understand something about the great change that is taking place in the world.

''We are at the beginning of an age in which it will be insisted that the same standards of conduct and of responsibility for wrong done shall be observed among nations and their governments that are observed among the individual citizens of civilized states.'' And again: ''But the right is more precious than peace, and we shall fight for the things which we have always carried nearest our hearts—for democracy, for the right of those who submit to authority to have a voice in their own governments, for the rights and liberties of small nations, for the universal dominion of right by such a concert of free peoples, as shall bring peace and safety to all nations and make the world itself at last free.''

The accomplishment of such an undertaking, tremendous though it be, is not impossible. Slowly but surely, forces in the social and the industrial orders have been preparing the way. Out of what seemed an endless, turbid stream of human misery, the rights of those who toil and suffer are beginning to emerge, and men and women of high purpose are devoting their lives to the cause of social justice that the social world may be redeemed. Politically, democracy is secure only when it has annihilated autocracy, but its victory is not complete until it has triumphed over feudalism, paternalism, and privilege, and has driven them from their industrial strongholds.

So accustomed are we to look upon the social question as the fad of those who strive to make the world a Utopia, that we fail to observe conditions as they are, or, having observed them, accept them as inevitable. The true social reformer, however, sees things as they are and refuses to accept them as inevitable. He recognizes that these sordid conditions are abnormalities that retard the real progress of civilization and make it a mockery to a large proportion of mankind. A dreamer he may be, but only because he has a social imagination and is convinced that we must return to the normal. The word ''normalist,'' as one writer suggests, would describe him more accurately—a normalist seeking the causes that have resulted in the deplorable failure of thousands to attain a decent standard of living. Hence it is that having found the causes, he seeks the remedy that must be applied. Poverty, disease, crime, overcrowding, under-nourishment, overwork, intemperance, lack of education, irregularity of employment or no work at all, monopoly, exploitation of men, women, and children—in short, whatever prevents the individual or groups of individuals from attaining a decent standard of living—are the things that concern him day and night. In the solution of these many problems, the medical profession has played, and will play, no small part.

In the old order, charity, which was no more than alms-giving, had to do with the individual. Too often its influence was degrading, because it was a sorry substitute for justice denied. Another form of charity is thus described by John Boyle O'Reilly:

> ''Organized charity, scrimped and iced,
> In the name of a cautious, statistical Christ.''

In the new order, it goes beyond the individual and aims to eradicate those intolerable social conditions that tend to perpetuate disease, pauperism, degeneracy, and crime. It attempts, as Professor Peabody says, ''to find a place in modern statesmanship, civic administration, trade, and personal life, for the ideals of humanity, fraternity, and social peace.'' In the old order, the charity worker considered it his duty to chide the poor, and tell them that their poverty was due to shiftlessness, lack of thrift, and intemperance. In the new order, it is recognized that poverty is not merely lack of money, but appalling and disastrous misery due to a low standard of living, overcrowding, overwork, disease, and friendlessness, for which our present social order is responsible.

It was the old idea that wages were determined only by the law of supply and demand. It is the new idea that the influence of the standard of living cannot be disregarded. It was the old view that the children of the poor should be taught early habits of industry and thrift that they might contribute to the support of the family, even before they had passed the tender period of childhood. It is the new view that children must not be exploited for commercial gain, but that they must be allowed to enjoy their childhood, acquire an education, and bring to their life-work healthy bodies, and minds trained to the ideals of citizenship. In the old order, education was considered the training in letters of a select few. In the new order, we believe that it is one of the most necessary and permanent interests of all mankind. It was the old idea that those who rose to positions of influence did so only through thrift, honesty, and ability. "Early to bed and early to rise makes a man healthy, wealthy, and wise," says the old adage. Modernized to apply to the toiler of today, the last part might read, "makes a man unhealthy, miserable, and wise"—yes, wise enough, at least, to grasp the new idea that many of the qualities that have enabled the successful to survive will not respond to the acid test of decency. Ignorance, arrogance, trickery, dishonesty, lawlessness, complete ethical paresis, have too often in the past prostituted the rewards of right living and generous service to mankind.

It was the old view that heredity alone determined the social position above which no man could rise. It is the new view that however much heredity furnishes the basis and sets the limits to the development, environment can furnish the stimulus and the opportunity. Heredity determines only what a man *may* become, but environment determines what he *does* become.

In the old order, it was held that men, women, and children, working in the industries, were machines to be speeded up to the highest possible endeavor for long hours in unsanitary factories during the day, for a low wage, and to be recuperated for their next day's work in even more unsanitary houses, during the night. In the new order, it is insisted that workers shall not be pushed beyond the limits of physiological fatigue, but that they shall be given a living wage, healthful surroundings, and decent housing.

It was the old idea that if the employer, usually defended by superior counsel, could prove with the help of witnesses fearful of losing their jobs that he was not responsible for some industrial accident, the maimed workman, or the widow and children, or mother, of him who was killed, must face a still more grinding life of poverty uncompensated. It is the new idea that industry shall bear on its broader and stronger shoulders the burden of accidents, and thereby relieve the injured workman, or the widow and orphans, from the black specter of hopeless poverty. It was the old view that our prisons represented the vengeance of society. It is the new view that they shall not harbor the insane and perverted, or serve as institutions for the graduation of expert criminals. In the old order, sickness was a family affair; in the new order, it is also a concern of the community, to be prevented, if possible, and to be segregated, if dangerous. That is why our hospitals and dispensaries, our nursing and medical care, have been fitted into our social scheme, and that is why large sums of money are being spent to reduce the prevalence of disease by studying those that are not yet conquered. It was the old idea that the case of the backward or incorrigible boy or girl in school was hopeless. It is the new idea that a physical examination, followed by proper treatment, or a change in our methods of education, by supplying manual training, trade, or vocational schools, may save both these children for society.

Now in using as I have the words "old" and "new," I feel that I must apologize for a paradox. What I have called the new is in reality the old. It is as old as the New Testament. It is the Christian view of life. It means faith, hope, charity, justice, love, decency, goodness, friendship, honesty, and generosity. It means the "square deal." It is the view of life that goes with red blood. It is the view of life that gives men "guts."

And the old view is in reality the new view. It is the view of Godless, hopeless, faithless, and dehumanizing philosophy. It is pessimism, modernism, materialism, and immoralism. It is the view that makes men cravens. It is the view of self-ordained supermen, of sycophants, of snobs, and of autocrats. It is the view of arrogant commercialism, heartless industrialism, predatory wealth, and speculative paranoia. It is the view of those who maintain that leisure and wealth are for the few, while the rest of mankind must "grunt and sweat under a weary life." It may be summed up in the teachings of Nietzsche, who raged against Christianity because it recognized the rights of slaves and reminded supermen of their bondage to the moral law. It enabled the weak, the whimpering, and the downtrodden to rise to positions in which he felt that they did not belong, and kept alive masses which ought to be left to die. He argued that sympathy, by preserving what is ripe for destruction, operates to defend the disinherited and condemned among men, and that it is the chief instrument in the advance of decadence. The preaching of sympathy by Jesus of Nazareth was an evidence of his immaturity and youth. "He died too soon," says Nietzsche. "If he had lived to my age he would have renounced his teaching." And this when Nietzsche was thirty-eight!

Moreover, when we turn to consider the functions of government, we are inclined to think that the idea behind the strong demand for progressive legislation is new, radical, and dangerous. Some of our modern progressive measures may be radical, but this is not an argument against the justice and necessity of many measures that occupy the attention of our leaders.

In 1225, ten years after John of England signed the Magna Charta on the historic field of Runnymede, that great teacher St. Thomas Aquinas was born. Although not favoring any particular form of government, St. Thomas held that authority in civil society must have in view the public good, and that if it lose sight of this it becomes unjust, anti-social, and tyrannical.

The aim of the state is not merely economic, but also moral. From this principle, St. Thomas deduces conclusions which are in remarkable accord with modern political theories,—for example, that it is the duty of the state to provide for the education of all its members and to see that no citizen suffers want. It is the fidelity with which the government adheres to the purpose for which it is instituted, that decides the happiness and prosperity of its citizens. Thus we see that what is apparently new in our theory of men's rights, and of the duties and functions of government, can be traced from the Magna Charta through the Declaration of Independence and the Bill of Rights, and through the principles enunciated and upheld by Washington, Jefferson, Lincoln, Theodore Roosevelt, and Woodrow Wilson.

In his progress through civilization to the present complexity of social conditions, man has had to solve many problems and combat many foes. Disease being an unseen foe, and ruthless in its destruction, has been his greatest enemy. Hence the medical profession has arisen. Always on the skirmish line in the march of progress, we may be forgiven, I think, if we assert that without our help man would not have attained his present position; but we must admit that in this march of progress, other doers and other thinkers have been many and indispensable, and we must not be offended, if they, too, with truth, assert that without *their* help *we* would have been unable to succeed. For what we have done, mankind is grateful, and in the past has shown us much respect and has showered us with many favors. To-day, society, none the less grateful, but niggardly in its praise and insistent on its demands, is beginning to look upon, as its own possessions, those great contributions to civilization such as electricity, steam, and the results and achievements of medical science, and demand that they be socialized and made a part of an equitable existence. And it is in this attitude of the social mind, therefore, that we who have been living our selfish lives, without thought of the social struggle going on about us, may seek the causes of several rude awakenings which in the past few years we have experienced. I refer to the Industrial Accident Act and Health Insurance. If the lessons learned from these awakenings have drawn us out of the path of Chauvinism, as I think they have, we shall lose no time in mobilizing our forces, and in developing a solidarity in our ranks that is much needed. We have been too long a profession composed of men who have been satisfied to live the narrow, selfish, and quite unlovely lives of individuals, rather than the broader, more useful, and most attractive lives of social beings. "When the entire moral energy of an individual goes into the cultivation of personal integrity," says Miss Jane Addams, "we all know how unlovely the result may become; the character is upright, of course, but too coated over with the result of his own endeavor to be attractive. In the effort toward a higher morality in our social relations, we must demand that the individual shall be willing to lose the sense of personal achievement, and shall be content to realize his activity only in connection with the activity of the many." Simplified, this may be called the philosophy of "mixing"; the call of the spirit of good fellowship.

The more successful among the members of the medical profession will find more joy of living, by converting the energy which they use in gloating over their successes into real altruistic endeavor not only for society, but for their less fortunate colleagues. Without this high purpose, manifested in such a spirit of *camaraderie* as we have never known, we shall have little to say in any new adjustment of human relations in which we are vitally concerned. In reviewing together some of our past achievements, we may find reason for a closer bond of union, for after all the ties that bind us to what Graham Wallas calls the "Great Society" inspire us with that confidence in one another and those generous feelings which have so often been forgotten or disregarded in the narrower view of life, resulting from the increasing and inevitable demands of specialism in modern medicine.

Two hundred years ago one tenth of our ancestors died of smallpox. In the last decade of the eighteenth century, Edward Jenner, noting the pure complexions and smooth skin of the milkmaids, wondered if the chance infection by cowpox protected them from the dreaded smallpox. Experiment proved him to be right and we had vaccination. Ninety per cent. of the population had smallpox at some time in their lives, and it is a well-known fact that few faces among the royal families were not pock-marked. In the years between 1893 and 1897, this disease was responsible for 275,502 deaths in Russia, while Germany had only 274. Germany has had no epidemic since 1874. The difference represents no vaccination and a compulsory law. When we went to the Philippines, five provinces gave a total death rate of 6000 people yearly; but following a system of compulsory vaccination in 1905 and 1906, there were no deaths from the disease in 1907. In three and one half million vaccinations in the Philippines, there were no deaths and no serious infections. From 1901 to 1905, 500 persons in Philadelphia died of smallpox, but not one of these had been successfully vaccinated within ten years. The epidemic of 1891 and 1892 cost Philadelphia over $21,000,000, while the total cost of vaccinating, disinfecting stations, public instruction, etc., was some $750,000. What are we doing to-day to keep alive the memory of Edward Jenner? What are we doing to see that these facts are taught to our school children as part of the history of civilization? What are we doing to keep this information constantly before the people and our legislative bodies that it may be impossible for those misguided individuals who attack society by opposing vaccination to advance against a machine-gun fire of deadly knowledge?

In 1900 Dr. Walter Reed of the United States Army discovered that yellow fever was given to man through the bite of the female stegomyia mosquito. This mosquito must bite a fever-stricken patient within the first three days of his illness. Thus the yellow fever patient ceased to be a direct source of danger when screened so that no mosquito could reach him. During the nineteenth century the deaths from yellow fever in Havana often numbered 1500 a year; but they stopped abruptly in 1902. Twenty-five per cent. of those attacked by this disease died. When the epidemic of 1878 struck our Southern cities people fled by thousands, and the cost is estimated at $100,000,000—not to mention the loss by death. What are we doing to keep alive the memory of Walter Reed? What are we doing to see that our school children and our people be made as familiar with these facts as they are with less momentous events in history?

The Panama Canal was made possible by the growth of our knowledge of disease. It will be remembered that, besides yellow fever, malaria was also a cause of a high mortality in those southern countries. For instance, the death rate in Havana from malaria before 1901 showed a yearly average of 400, rising in 1898 to 1900 deaths. Since 1901 there has been a gradual decrease until 1912, when there were only four deaths. At Panama in 1906, 821 out of every thousand were admitted to the hospitals for malaria, and in 1913 only 76 per thousand. Of the general situation in Panama Dr. Gorgas says: "We had an average of 900 men sick every day. For the year, this would give us 328,500 days of sickness, and for the ten years 3,285,000 days of sickness. If our rate had been 300 per thousand,—a very moderate figure compared to what it was under the French,—we should have had 11,700 sick every day. For the year this would have given us 4,270,500 days of sickness, and for the ten years 42,705,000, a saving of 39,420,000 days of sickness during this period." This is equal to a savings in cash of $329,420,000.

"During the ten years of construction, we lost by death seventeen out of every thousand of our employees each year. That is, from the whole force of some 30,000 men, 663 died each year, and for the whole construction period we lost 6,630. If the sanitary conditions had remained as they had been previous to 1904, and we had lost as did the French, two hundred of our employees out of each one thousand on the work, we should have lost 7,800 men each year, and 78,000 during the whole construction period." This means that 71,370 lives were saved. The Panama Canal is a monument to many things—the initiative of the American people; the leadership of Theodore Roosevelt; the triumph of modern engineering; the development of steam and electricity; and the dignity of labor. We, however, like to think of it as a monument to preventive medicine, and we hope that sometime the traveler passing through its waters will find here and there a little memorial that will commemorate the work of Jenner, Pasteur, Walter Reed, and others whose work in scientific medicine helped to make possible the accomplishment of this gigantic task.

Typhoid fever formerly caused the death of 30,000 Americans a year. In 1900, the death rate in the United States was 46.5 per 100,000 inhabitants. We have reduced it to 25 per hundred thousand, which is not as low as it should be, considering the European death rate of only 6.5 per hundred thousand. In 1898 in the seventh army corps at Jacksonville, Florida, (10,769 men), there were 4,422 cases of typhoid, with 248 deaths. In the 1912 manoeuvers at San Antonio, Texas, among 12,801 soldiers there was only one case. During the Spanish war there were 20,738 cases of typhoid, with 1480 deaths. Nearly one fifth of the entire army had the disease, and it caused over 86% of the mortality of that war. In the Franco-Prussian war it was responsible for 60% of the mortality among the German troops. Vaccination against typhoid is alread a routine practice in our armies. Before it was introduced, the British garrison in India had a yearly average loss of 500 men from typhoid, but in 1913, less than twenty died. The Russo-Japanese war was the first in history where disease played second rôle to death in battle, and the present world struggle will, we hope, show preventive medicine at her best.

In 1892 Behring, who died almost unnoticed the other day, discovered the anti-toxin of diphtheria. In 1890 its death rate was 66.9 per hundred thousand; 32.7 in 1900; and 19 in 1905. We are fighting cancer, leprosy, and tuberculosis. The sleeping sickness is being conquered. We know more about syphilis than we ever did. Thanks to Dr. Richard P. Strong, we have some control over the bubonic plague, which in the fourteenth century destroyed 25,000,000 people, or more than one fourth of the population of Europe. We are free from Asiatic cholera, which in the year 1885 cost Japan 100,000 lives.

What Pasteur has done for mankind would fill volumes. He who has not read that excellent biography by his son-in-law, Vallery-Radot, lacks a liberal education and has missed some of the joy of living. He was not a doctor of medicine, but a member of that ancient and honorable company of scholars. The son of a simple tanner, he belongs to the people, not to us. Much that we are to-day we owe to him, the father of preventive medicine, the father of bacteriology, the father of life-saving surgery and obstetrics, the conqueror of rabies. Before Pasteur discovered the cause of sepsis, the lying-in hospitals of Paris showed death rates from sepsis of from twelve to twenty per cent. In 1909 the New York lying-in hospital lost only .34 per cent. of 60,000 obstetrical cases, or one out of

1250. The mortality of ovariotomy, formerly 69%, is now 2%; that of compound fractures, formerly 60%, is now 3%; the mortality of major amputations, formerly 50-63%, is now 23%. Lister, who is usually credited as the father of aseptic surgery, gave all the credit to Pasteur. As the years go by, what are we doing to honor and perpetuate the memory of this great Frenchman? No possible argument against vivisection can influence a people familiar with Pasteur's contribution to mankind.

> "Not with the dead should he be laid asleep,
> Who wageth still with death triumphant strife,
> Who sowed the good the centuries shall reap,
> And took its terror from the healer's knife."

Here is a rich heritage of historical medicine that may be fitted into our popular scheme of education and utilized to great advantage. That it is being allowed to mould and rot in our libraries in dusty volumes is surely not to our credit. We have health campaigns, it is true,—baby weeks, tuberculosis exhibits, and public lectures, which undoubtedly do some good. But most of these are undertaken not by our society, but by public health boards, and other independent organizations that are interested in the sanitary aspect of the social problem. Working independently of one another, they lack that coordination of effort which is so necessary to ensure success. Too often they enlist the services of amateurs, women and young girls, who look upon the work rather as an adventure than as the undertaking of a serious problem that has an ultimate, definite solution. The people they seek to help often wonder what it is all about, because these facts are presented to them dissociated from their true place in the world's progress. We impress our people with the true historical relation of our old landmarks. Thus it is that Bunker Hill, Lexington, Concord, and the Washington Elm mean something to them. But when we talk of tuberculosis, for instance, we employ archaic methods of education, which tend to frighten rather than educate. We tell them that every time the clock strikes, so many die; and we emphasize the deaths with big figures. Our voices and faces become distressing and melancholy, and monotony is the result. People grow tired of us and seek interests that are more agreeable.

This defect in our system of instructing the people in public health is in fact analogous to the defect in the educational system that trains our workers. "The man in the factory, as well as the man with the hoe," says Miss Jane Addams, "has a grievance beyond being overworked, in that he does not know what it is all about. We may well regret the passing of the time when the variety of work performed in the unspecialized workshop stimulated the intelligence of the workingmen and brought them into contact both with the raw material and the finished product. But the problem of education, as any advanced educator will tell us, is to supply the essentials of experience by a short cut as it were. If the shop constantly tends to make the workman a specialist, then the problem of the educator in regard to him is quite clear: it is to give him what may be an offset from the over-specialization of his daily work, to supply him with general information and to insist that he shall be a cultivated member of society with a consciousness of his industrial and social value." Great social thinkers, therefore, unmoved by the slogan that this is an age of specialization, are making new demands upon our educators and insisting that they realize that the individual in the industrial order needs, as Miss Addams says, "the conception of historic continuity in order to reveal to him the purpose and utility of his work; and he can only be stimulated and dignified as he obtains a conception of his proper relation to society."

This idea ought not to be difficult to grasp, for we are all victims of the same short-sighted system of education. We study medicine and its specialties primarily to make a living, and it seems that the curricula under which we have been trained were arranged with only this idea in view. We have missed the historical aspect and the social relation, not only in our preliminary, but also in our medical, training. Small wonder is it then that we are narrow, and easily roused to anger when a layman dares to express a medical opinion, or when a colleague displays any knowledge of our specialty. We develop a frigidness which we mistake for dignity, and cease to be approachable when a member of our patient's family questions us pointedly about the patient's condition. We criticize the clergyman who thinks he is a "wise fellow" in medicine, forgetting all the time that we do not hesitate to air our views on religion. We gradually grow to that condition of mind which convinces us that our colleagues cannot possibly know medicine, and we like to tell for our own enjoyment "how we put one over on Dr. So-and-so, who missed the diagnosis." When we hear that a certain family is being attended by our colleague down the street, we assume that gracious yet easily interpreted manner of one who says "Are those people crazy?" We are incompatible as individuals, we are incompatible as groups. It is "I am a big man, you are a small man. I have a big income, you have a small one. I am a specialist, you are a general practitioner. I am a real surgeon, you are only a gynaecologist." Bounded by nutshells we think ourselves kings of infinite space.

Retarded by mean and trifling jealousies, imaginary differences, local feuds, and exalted ideas of class distinction, we are rapidly approaching a condition of intellectual stagnation; and unless action is substituted for lethargy, we cannot hope that our position in the "Great Society" will be any better than a maladjustment, especially for the rank and file—for those of us who, toiling with the toilers, sow much but reap little in worldly reward. Because of our indifference to matters outside of medical practice, our effectiveness as an aggressive social force among the people and before legislative bodies has never materialized We represent potential, not dynamic strength. We are little candles throwing little beams, when we could be one powerful sky-searching light by accommodating the program of our activities to the many problems that bind us to one another as well as to society. The interest awakened recently in the idea of applying rigidly to all our work the test of "end results" is indeed a happy omen. By its direct appeal to the people, who, although indifferent to the mysteries of technic, diagnosis, and experimentation, are alive to results, this idea not only stimulates us to better work, but it also reminds us that the social value and dignity of which Miss Addams speaks, are in our case measured by the quality and not by the quantity of our work. Our end-result campaign, then, expresses a quickened sense of social justice, a desire for a higher social morality.

Social insurance, which in our state and in many others has already more than justified its usefulness, since the passage of the various Workingmen's Compensation Laws, was apparently not "as welcome as flowers that bloom in the Spring," when, in the past year, it paid another visit to Massachusetts in company with two other handmaids, health insurance and old-age pensions. Workingmen's Compensation represents social justice long desired and too long delayed. In 1908 the first act of this kind was passed by Congress at the earnest request of Theodore Roosevelt. It included a small number of Federal employees, and although inadequate in its benefits, it was more than adequate in the moral effect of its example. Up to June 1, 1916, thirty-three of our states and territories had compensation acts on their statute books, but so far, other forms of social insurance have made but little progress. These compensation laws provide for compulsory insurance of employees or for elective insurance, with the alternative of abrogation of the main defenses of the employer under the common-law rules.

Formerly industrial accidents and deaths were the source of incalculable misery. Statistics were unsatisfactory as they were either inaccurate or entirely lacking. In New York and Pennsylvania, the old employers' liability laws were worse than none at all. If an injured man had no legal claim whatever on his employer, he had to rely on his generosity. In the investigation of the facts in the cases of 304 deaths of men who were contributing wholly or in part to the support of families, the following facts were disclosed: Two-thirds of these men were married; 88 of the 304 families received not a dollar of compensation; 93 of the 304 received not more than $100; 62 received more than $100 but not more than $500; 61 received more than $500—most of them less than $1000. That is, 181 families, 59½%, had to bear the entire income loss, and only 61 families, or 20%, received in compensation for the death of a regular income provider more than a sum which would approximate one year's income of the lowest paid of the workers killed. Statistics of this kind might be multiplied. For example, in the report of the New York Commission on Employers' Liability, we find that ten companies, which reported their employers' liability separately, received in three years, $23,523,585 in premiums and paid out in the same time for injuries, only $8,559,795. In a word, much of the financial loss was borne by the workmen—not to mention the resulting misery and distress.

Conditions are better to-day, but there is still much to be done before the employee is satisfied that the present system represents full justice. We may rejoice, however, that a worthy cause has been given a flying start. Therefore when we think of our grievances under this act, let us remember that the workingman has *his*, and that they are more urgent than *ours*. By the introduction of safety devices, better sanitary conditions, and shorter hours of labor, all of which will tend to reduce accidents to a minimum, the idea of workingmen's compensation will bring other and greater blessings; and what is also of importance is that we shall have in the future accurate statistics of industrial accidents, diseases, and deaths, and also financial statistics relating to the business side of this reform. Until we have sufficient data to further analyze this complex problem, we shall have to be content to wait for a more just settlement of the questions that vex our profession. Through our failure to anticipate this legislation by a timely and careful study of social insurance in all its aspects, we are the victims of our own unpreparedness. That workingmen's compensation is now being discussed in our meetings and in our journal is another happy omen, another sign of our quickened sense of social justice.

We are at present engaged in a heated controversy with the supporters of health insurance. What most of us know about it has been learned in a hurry and is still undigested. As an instrument for the amelioration and even the elimination of many present undesirable social conditions, it has in its favor all the arguments that make workingmen's compensation a permanent institution. The difficulty is in the complexities that arise when an attempt is made to fit it into our social scheme. Among the poor, sickness is more frequent and more disastrous in its results than industrial accidents. The poor, and even some who cannot be called poor, find it hard enough to meet the expense of medical service. Our medical schools still send men into general practice and seem anxious to increase the numbers of their students. In school we are not told that general practice is to be avoided, but we are sent forth with the idea that ours is a noble profession, honorable in all its callings. Few become specialists; many, not of their own choice but through necessity, seek the harder but sometimes more quickly remunerative work of general practice. The Harvard Graduate School of Medicine is trying to help these men by courses intended to keep them in the front rank of medical progress. This school has even adopted a missionary plan of education by sending men to different cities to spread the truth. What subtle influence is there then inside and outside our profession behind the increasing prejudice against the general practitioner? Why is he so frequently dubbed—and I am now quoting Rubinow—a "Jack-of-all-trades, whose persistence is out of harmony with the recent phenomenal development of scientific medicine"? And he adds, "There is perhaps a distance of a quarter of a century between the present status of medical science and that of medical practice among the poor." These are not new ideas, and we have no contest with Rubinow if he uses for his own purpose statements that have been fed to the public for years, while we as individuals have all selfishly assumed that since we had no over-draft at the bank, these disparaging statements must refer to the other fellow, our neighbor down the street, and not to us. Rubinow has done his part of the work thoroughly and well, as his scholarly treatises on the subject testify. The powerful influences behind health insurance could not have been effective without him. His most difficult task is not to prove the justice of his cause, for that speaks with millions of mouths. The real difficulty is, in slang phrase to "put it across," for never before did any other social welfare measure present so many economic, ethical, social, and political complexities. Fully aware of our weakness, Rubinow had no hesitation, but, like a seasoned campaigner, he quickly mobilized his forces and crossed our boundaries. We lacked leaders; we lacked guns and ammunition; we even lacked shovels with which to dig ourselves in. "It's unconstitutional," we yelled. "It's flagrantly unconstitutional; it's outrageously unconstitutional!" This was the old protesting cry of the trusts against the cruel and abusive treatment of the common people. Think of the poor general practitioner imitating a trust when his income is about to be shot to pieces! "What's the constitution among friends," said Rubinow with a chuckle, as he sat in with his colleagues and proceeded to draft the bill. He probably remembered that when Theodore Roosevelt interfered in the anthracite coal strike early in his administration, he did not create the sentiment which supported him so loyally in his extra-constitutional act. That sentiment was already born, and when Roosevelt declared the common good to be paramount to private right, the Fourteenth Amendment Club, composed of men enjoying the un-American distinction of corporate personality, lay down, like Fido, and didn't even dare to beg. Now in the sentiment that supported Roosevelt against the coal barons, and in the sentiment so persistently and cunningly worked up against the general practitioner, the social insurance extremists thought that they saw an analogy.

But the sentiment that supported Roosevelt was born of love of justice, intensified by bitter hatred of injustice long endured. It was expressed in the unflinching and far-flung challenge by millions of people to the greed of a corporate few. The sentiment against the general practitioner, however, on which the success of this measure largely depended, was born of injustice, hypocrisy, and intrigue. It was expressed only in the incomprehensible and irreclaimable narrowness of a few men, righteous enough in a small way, perhaps, but not agreeable, whose feelings, mildewed by a long, vitiating process of refrigeration, have prevented them from mingling with the crowd spiritually as well as physically, and learning, in the words of De Quincey, "the thoughts, the yearnings, the aspirations, the sympathies, and the repulsions of heart," of those millions of intelligent citizens, who have still to be convinced that the general practitioner is a plague unchecked, and the modern specialist a blessing unalloyed. When this fight began, the medical profession was consanguineous in the first degree with those pacifists, who, Roosevelt says, maintain that world peace is only possible by a disarmament that even goes into the nursery and destroys the toy pistols and the tin soldiers of the children. Happily our disarmament had not been completed and the situation became productive of leadership.

There were other weaknesses in the bill as it was drawn, and since Rubinow was perfectly aware of these facts, I wonder that he did not find some means of making his pet measure less objectionable to the people. The proposed creation of a "twenty-five-dollar-a-week-or-less" social class was an insurmountable difficulty, for it included most of our women school teachers, and thousands of others, who, unable to attain a proper standard of living without constant worry and hardship, are continually fighting for a just stipend. Social insurance must not be a substitute for higher wages. Besides, people resent the idea that they belong to a class which cannot choose their own physicians without paying double freight. We have heard much of Germany's success in social insurance, but I doubt if we shall hear as much in the future. Her efficiency, if it *is* efficiency, *is*, or rather *was*, beyond dispute. But as Mr. William Roscoe Thayer says, "Efficiency is of itself no more praiseworthy than is electricity. The vital consideration is, who applies it and for what purpose. If the object be evil, then the harm done is greater in proportion to the greater efficiency. The voltage of a lightning bolt which sets fire to a town might supply power to run a dozen factories. Granted that Kultur-made efficiency ranks first, has it been justified by its works?"

It would seem, then, that democracy must avoid a system of efficiency that reduces men to soulless machines. She must learn that the only system of efficiency for her is one that does not lose sight of real human happiness. When autocracies speak, there is no appeal from their edicts, but in democracies, we object to the control of our intimate domestic and social arrangements either by the state or by altruistic corporations of great wealth. It is a settled fact with us that the state is for the people, not the people for the state. And we are proving also in our struggle for progressive legislation, which is in reality a fight for social justice, that neither the corruption of capital, nor the machinations of politics, nor the social myopia of unsophisticated but well-meaning reformers, shall assume that they are above both the state and the people. This does not mean that old Demos is always governed by his intellect and that his decisions always represent a careful consideration of the merits of the question. In democracies, the controlling forces are at all times emotional rather than intellectual, even among those who are highly trained. This is especially true when Demos is opposing Croesus, or the reformer who impresses him, not with meekness, but with that brand of exotic goodness which cannot endure the pollution of his presence.

Thus the emotional tendency of the crowd cannot be disregarded, for if it carries potential harm, it also carries, and in a greater measure, potential good. If the demagogue has won many an unworthy cause by discerning its presence, the reformer has lost many a worthy one by assuming its absence. Its harm is rather negligible and transitory, its good, incalculable and lasting. It is with this psychological fact that the future of health insurance is linked, as are also linked the futures of many other social measures, and even the future of our profession. We appeal to the emotion of the crowd, when we ask them to be loyal to us, and when we tell them that while admitting the need of some form of health insurance, we deny that it can only be secured at the expense of injustice and indignity to them and to us; but we appeal to the intellect, as well as the emotion, of our more fortunate colleagues, when we say to them that unless they establish lines of more cordial and brotherly support with those who are fighting in the trenches of general practice, theirs will be the blame for any maladjustment of the medical profession in our social order. Our fight is their fight. We are their first and only line of defense.

Rubinow will come back. He has retired but is not defeated. We have advanced but have won no victory. Let us forget Rubinow, but remember his lesson of preparedness. Let us forget the old slogan of the trusts, but remember that the people are no longer awed by constitutions. Rather let us bend our efforts toward solving this critical problem, for we have come to the parting of the ways. So far the only constructive suggestion has come from Dr. E. A. Codman, of Boston, and since his plan is economically, ethically, and ideally sound, it deserves our careful consideration. It is based on efficiency (the American idea), on standardization of hospitals, and on end results. It is a reform that begins at the top and goes to the bottom. It calls for medical service that is systematized, humanized, and vitalized. It puts the responsibility for medical progress where it belongs,—on the medical profession,—and it draws a line of cleavage between the physician and the social worker. It eliminates the amateur; it eliminates the unfit. It annihilates privilege, opens the door to opportunity, and socializes our organization. It guarantees a square deal to the poor, and makes possible better treatment for those who are not wealthy. It raises the dignity of our profession, because it commands the respect of the people by recognizing their right to the use of those expensive instruments of diagnosis and treatment in institutions which they directly or indirectly support. In short, it shows us a simple solution of many other allied social questions by readjusting our organization to meet more adequately the needs of all our people.

Such social benefits are impossible under the proposed bill because it is too much tainted with the abstract Utopian idea of improving medical service while deteriorating the medical profession. Health insurance, if it is to be realized, must be an attainable, concrete, living idea that will create a better medical profession—more generous, better trained, better organized, broader visioned, more influenced by a higher social morality, and more productive of real leadership. Otherwise high-grade medical service, like high moral standards, is beyond the compulsion of human legislation.

There are other social problems involving our profession that are soon to demand an answer. Unless we go forth to *meet* them with the aggressive and uncompromising spirit of a militant and elevating social force, sex hygiene, eugenics, and birth control will come to *us*, swaggering with the insolence of popular hysteria and the coarseness of unbridled demagogy. By spreading a knowledge of sex relations and of the vices and evils resulting from sexual indulgence and lack of moral stamina, sex hygiene seeks to emphasize the importance of chastity. The end in view is a noble one, but the ways and means that are being employed to attain this end are open to criticism and rebuke. If merely a knowledge of sex relations and of the dangers of venereal disease would open the gate to chastity, close the door to prostitution, and send to the shambles gonorrhoea and syphilis, there would be some hope even for those benighted people east of Suez, ''where the best is like the worst, where there aren't no Ten Commandments an' a man can raise a thirst.'' We must admit, however, that west of Suez, where we have, and have had, the Ten Commandments, that neither education, nor wealth, nor position, nor culture, nor marriage, nor the physician's intimate knowledge of these facts, nor prohibition, nor total abstinence has proved impregnable to human frailty, or to the diplococcus or the treponema pallida. And yet may we not say with truth that the Ten Commandments have supplied the most dependable restraint?

Exaggeration, narrowness, hysteria, error, and insult frequently characterize this campaign. It cannot be denied that the discussion of sex with children of tender years may easily arouse cravings that would otherwise remain dormant. There are those extremists who desire to have this subject taught in the pulpit, in the day-schools and Sunday schools, in the factories, and in the press. They say that this conspiracy of silence must be broken; and one lecturer makes the startling discovery that one of the causes of this conspiracy is found in the Hebrew law, which, while enjoining the duty of multiplying, surrounded the only processes by which race continuation is possible with the idea of impurity. After childbirth the mother was considered unclean for a month or more, and was not permitted to touch any hallowed object. ''Accordingly, the mother of God was considered unclean for more than a month because she gave birth to Jesus Christ.'' He pursues this idea as follows: ''The Christian church, by referring to the conception of Jesus as 'immaculate' [that is, spotless], emphasizes this point by the unmistakable implication that other conceptions are maculate [that is, attended with fulfilment.]

''The comparatively recent adoption of the dogma of the immaculate conception of the mother of Jesus, by slightly extending the idea of purity in the matter of the propagation of the human species, still further enforces the rule, particularly as the proposition was strenuously opposed in the council which finally adopted it.''[2] If the Jew feels that his future in America is bound up with the traditions of his past, is it not an insult to him to speak lightly of those traditions? If the Roman Catholic celebrates the feast of the Immaculate Conception of Mary (which is not a new doctrine any more than the celebration of Lincoln's birthday as a legal holiday would be an evidence of his recent deeds or of anything new discovered in his life), what deformity of the human mind can assume that this supreme expression of respect for motherhood and maiden purity connotes an idea that is antagonistic to a propaganda, the purpose of which is to drive from the face of the earth, if it can do so, the fornicator, the adulterer, and the harlot? We may leave extremes of this kind to a conspiracy, not of simple, but of contemptuous silence.

The whole story of sex hygiene is well summed up by the editor of *Collier's*, that gifted and interesting young Harvard man of the class of 1900, Mr. Mark Sullivan. ''It seems clear,'' he says, ''that experience so far shows that the whole problem of sex had better be approached in the spirit of personal reserve that we associate with the better sort of home life, rather than in the spirit of eager curiosity and practical experimentation that we associate with the school. . . . Any system of instruction which gives a knowledge of sex hygiene merely as mechanical knowledge will be a great mistake. Any instructors given this responsibility must have the spiritual force to conquer these problems, and the personality to compel their pupils to reverence. Anything less will be instruction for dogs, not for human beings.'' Are we prepared, in the name of our school children, to protest against the introduction of a system of canine instruction in our schools?

Eugenics, founded on the newer biology and on our increased knowledge of heredity, expresses an interest in some important human problems. It is negative and positive. In its former aspect, which opposes the reproduction of the unfit, it greatly concerns us. If it should become the law in this state, that feeble-minded and other low-grade human beings shall be surgically sterilized, those in the medical profession whose religious belief does not oppose such a measure will have a grave problem to solve. The sterilization of males and females, besides being attended with the usual risks of operation, gives to unprincipled men an opportunity to use our profession as a tool for injustice to others. Wills may easily be broken, and bequests easily diverted to the unworthy, if progeny is thus prevented along a certain family line. Legalized, sterilizing surgery, like legalized abortion, would have a tendency to lower our social morality. In the case of the feeble-minded and other defectives, negative eugenics has the sanction of biology, but like many other social reforms, the problem to be solved is so complex, economically, morally, and religiously, that we must not assume too readily that the segregation of those unfit to reproduce will not in the end be less burdensome to society than surgical sterilization. The eunuch was a creature of an obsolete civilization; let us not make our civilization obsolete by his presence. The Great Wall of China was built by the labor of 600,000 prisoners, surgically reduced to the condition of oxen. The experiment has never been repeated. Let us beware lest our enthusiasm for attractive social measures lead us into the temptation of substituting a heavier burden of social misery for one that is at least bearable.

Birth control, the most clamorous of all these questions, has for its ultimate aim, so its supporters say, the better and greater development of the individual. Malthus's remedy, over a hundred years ago, was to discourage marriage among those who could not afford it, or else to throw into the sty of human misery the families of such unions. "These are the unhappy persons," he says, "who in the lottery of life have drawn a blank." He did not recommend contraceptive measures or abortion to keep down the birth-rate, but depended rather on the acts of abstinence and self-control. The modern Malthusians, however, of whom Havelock Ellis is the high priest, recommend contraceptive measures, and do not seem to express any pronounced disapproval of abortion. In a popular magazine,[2] several years ago, Ellis declared that "women have an abstract right to abortion, and that, in exceptional cases, this right should be exerted, even though it is an injurious, wasteful, and almost [note the "almost"] degrading method of dealing with the birth-rate." There has appeared in this country a newer school of birth-control, the purpose of which is to give information and distribute literature on contraceptive methods by repealing in the first place the laws that at present stand in their way. Their slogan seems to be "Everybody's doing it." Hence they desire to help the poor, and others who may wish to limit the number of their offspring.

A writer of this American school[4] has determined to devote his feeble pen and leisure time to these things: "First, to advocate the propriety of preventing conception, of limiting the number of one's children according to one's economic means and other circumstances; second, to a study of the best, safest, and most harmless means of preventing conception; and third, to a dissemination of this knowledge among the medical profession, and through it, among the laity." The pen that can do this is not feeble, but mighty and dangerous. These dangers are apparent even to a feeble imagination. This same writer chafes at the idea of religious people "forcing their morals and their conduct upon people who are guided by different standards of morality.... Religion is a matter of faith and not reason; you believe so-and-so and that is all there is to it." Now the social question and religion are not rivals. Blind indeed is that reformer who does not see that religion can play and must play a momentous part in this irrepressible social conflict. Social questions are not altogether economic facts, but they also present moral, ideal, and religious aspects, which cannot be ignored. Even the industrial world, big, powerful, and at times pitiless, which would seem to be dominated only by the bloodless rule of economics, is a moral fact, inasmuch as it rests on credit, and depends for its existence on the confidence which the people have in its integrity. And if the industrial world is a moral fact, much more so is the family, which is the basis of our whole social structure. In it are developed those social virtues of loyalty and generosity; in it we see the kindergarten of the moral education of the race.

"The family, many people may be almost surprised to learn," says Professor Peabody, "is not a device invented to procure either personal happiness or mutual convenience. The family is, on the contrary, the world's first and greatest venture in altruism. . . . The family is in danger when it is created for what one can get out of it; and it is safe only when it is prized for what one can give to it. . . The most important step in the education of the human race is taken, when out of the surviving instincts of animalism and commercialism there emerges, in a man or woman, the ideal of a humanized love, dedicated to the creation of a family, and finding in that union, not limitation but enlargement, not sacrifice but joy." To assume, then, that neither religion nor morality has any grounds for opposing birth-control is to express a practical materialism, cynical, pessimistic, and brutal, which jeopardizes the entire social question. "How feeble a conception must that man have of the infinity which lurks in a human spirit," says De Quincey, "who can persuade himself that its total capacities of life are exhaustible by the few gross acts incident to social relations or open to human valuation!" Social changes sought by changes in economic methods bear the cruel imprint of the cloven hoof when they seek to overthrow the world of the human heart.

In our social order, men of religion are second to none in dignity and worth, because in their teachings are found the essentials of the highest type of good citizenship. Herein lie the strength and the hope of democracy. In their philosophy are more things than many a social reformer or economist has ever dreamed of. In their code of morality, standards are termed high or low. They are not concerned with "different" standards, and moreover they do not feel, when they are protecting their flocks, that they are forcing their own morals and conduct upon those reformers whose code of morality is, in their judgment, a menace to society. They do not believe that religion is altogether a matter of faith and not of reason. They teach that where reason ends, faith begins, and that faith does not contradict reason, but strengthens and supplements it. A man's acceptance of, and adherence to, a religious belief is very clearly a fact in the domain of reason and not of faith. "On the question of immortality," says Osler, "the only enduring enlightenment is through faith." "Life is for action," says Cardinal Newman. "If we insist on proofs for everything, we shall never come to action: to act you must assume, and that assumption is faith." In a human sense, faith, that is, confidence, makes possible the existence of our complicated financial system. Hence we see that faith is not altogether divorced from reason. Religion is a hard task-master, a good disciplinarian. "The fundamental need of democracy is discipline," says Mr. William Roscoe Thayer, "and that is all the more difficult to organize and apply in a society based on the cardinal principles that each of its members shall be hampered as little as possible by the state in his personal freedom." "Religion makes the march of progress possible, and the struggle of life less severe," says the Reverend Edward Cummings. "But for it the rank and file of those who toil and suffer would be driven in desperation to join a socialistic mutiny." By taking a broader view of the social question, the birth-control enthusiast will be able to visualize the dangers, as well as the safeguards, of our Democracy, which is now undergoing the most distressing trial in her history. But he must first get over the idea that the religious teacher is merely a sky-pilot, in an old Wright model, endeavoring to break the altitude record in a fool's attempt to establish a wireless connection with the supernatural.

As a matter of fact, there is no other social question in which there is such a confusion of cause and effect. Civilization is not destroying itself, and "everybody is *not* doing it." Programs of social reform based on such unwarranted assumptions will only undo the good already accomplished by those whose moral maturity has kept their course true between the Scylla of sentimentalism and the Charybdis of pessimism. Social misery is not the result of big families, but rather an unnecessary and indefensible condition caused by a disregard of those finer feelings that spring from what the world sneers at as sentiment, but which in reality denote the true religious spirit. What the world most needs is more, and not less, evidence of this spirit among those whose decisions determine the happiness or the heart-aches of the people. "If the Christian character is to have any place in modern life,"—if I may quote Dr. Peabody again,—"it must be precisely where these men are, in the heat of the world's work and under the load of the world's care; and the worst of disasters, alike for religion and for business, is to separate the one from the other."

The subject of social progress, even as it relates to us, is too appallingly big to pursue further within the limits of this paper. It travels many roads, crosses many fields, and conflicts with many interests. Have we as individuals reached a condition of intellectual stagnation which makes it impossible for us to be responsive to the vital needs of our complex social order? Or have we as an organization become so deaf to the crying distress of the people that we are satisfied to remain more interested in adhering to traditional programs than in going forth to meet new issues? Into the midst of much heated discussion, I have tried to project a point of view which will not vanish when subjected to the ripened judgment of experience. Firmly believing that the future of our profession in this new social age, depends on our devotion to the highest ideals of life, I submit this essay to the enlightened criticism of my colleagues, with the hope that it may in some little way serve to show us our duty in the great task of social regeneration which will "make the world itself at last free."

Note: I wish to acknowledge my indebtedness to many books. I would especially mention that excellent little book, which is a veritable gold mine of information, The Physical Basis of Society, by Prof. Carl Kelsey of the University of Pennsylvania. D. Appleton & Co., New York, 1916.

REFERENCES.

[1] A Wise Preliminary to the Adoption of Any Compulsory Health Insurance Act. E. A. Codman, M.D., Boston Medical and Surgical Journal, March 22, 1917.

[2] Sex-Hygiene. A Talk to College Boys. F. H. Gerrish, M.D., LL.D., Professor Emeritus of Surgery in Bowdoin College. Boston, The Gorham Press, 1917.

[3] Physical Culture, September and October, 1915.

[4] The Limitation of Offspring. William J. Robinson, M.D. The Race Betterment League, New York, 1916.

STUDIES OF INFANT FEEDING.

VIII.

The Mineral Constituents (Ash) of Milk.*

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and

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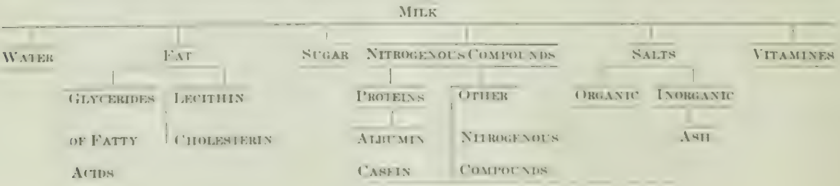
[From The Boston Floating Hospital Laboratories.]

Milk is often spoken of as a food containing all substances required for growth. This may be represented diagrammatically as follows:



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* Read before the New England Pediatric Society on March 30, 1917.

Chemically, milk may be considered as water carrying a mixture of food substances, these substances being present in the water, in true solution, in colloidal solution, in suspension, and in the form of an emulsion. The conditions in which the different components of milk are carried in the water are shown in the following table:

1. Milk constituents in true solution in milk serum.	2. Milk constituents partly in solution and partly in suspension or colloidal solution.	3. Milk constituents entirely in suspension or colloidal solution.
(*a*) Sugar	(*a*) Albumin	(*a*) Fat
(*b*) Citric acid	(*b*) Inorganic phosphate	(*b*) Casein
(*c*) Potassium		
(*d*) Sodium	(*c*) Calcium	
(*e*) Chlorine	(*d*) Magnesium	

The composition of milk will vary with the species and with individuals of the same species. The average compositions of the two milks with which we are concerned are as follows:

Composition of Cow's Milk and Human Milk

	Cow's Milk Per Cent.	Human Milk Per Cent.
Fat	3.90	3.30
Milk-sugar	4.90	6.50
Proteins (combined with calcium)	3.20	1.50
Salts	0.90	0.31

If the differences shown in this table were the only ones confronting us in the problem of properly modifying cow's milk for infant feeding, many of the formulae now in use should serve the purpose very well, for it is very easy to modify cow's milk in such a manner as to give a mixture which will contain the amounts of fat, sugar, proteins and ash found in human milk. There are other differences, more deep-seated and obscure, however, comprehensive consideration of which may be far-reaching in practical application, when they are more fully understood.

Breast milk is nature's food for the infant, and we may consider the constituents to be so balanced as to meet all the demands of growth, with a minimum of waste. Cow's milk, on the other hand, is nature's food for the offspring of the cow, and is not balanced in any respects as a food for infants, and its use as such must usually be preceded by some form of modifying which will make the quantitative relations between the fat, sugar, protein and water approximately that found in breast milk. In most, if not all, of these methods for modifying cow's milk, the mineral elements present receive very little consideration, being passed over with the statement that modified cow's milk will always contain a larger percentage of ash than breast milk, and hence will furnish all the mineral elements necessary. The time has come, however, when this phase of the feeding problem can no longer be treated in this manner, and those concerned must realize that more care must be taken to see that the mineral elements are properly balanced. This adjustment must take into consideration not only the mineral elements themselves, but also their relations to the organic constituents of the food, for it is well known that certain of the mineral elements may interfere with the proper utilization of the organic components. This is especially true with respect to calcium and fat.

It is known that bottle-fed infants absorb and retain a much smaller percentage of the mineral elements ingested than is the case with breast-fed infants, and this has been considered as due to the fact that bottle-fed infants receive an excess of mineral elements, and necessarily must excrete greater amounts. While this is in part true, we wish to emphasize the fact that in using cow's milk for infant feeding, the larger excretion of mineral elements is, for the most part, due to the fact that these elements, as they are present in cow's milk, are not completely available as food for infants. It will be seen, therefore, that the consideration of the forms in which the mineral elements are present is the important fact, and not the mere presence of these elements, for the presence of a certain amount of an element does not necessarily mean that the whole amount is available as a food for infants—a fact which has been demonstrated by investigations now under way in this laboratory.

It has been shown by one of us that, while di-calcium phosphate ($CaHPO_4$) is a normal constituent of cow's milk, it is not a constituent of human milk. As this salt has always been found by us in large quantities in the feces of infants fed upon cow's milk, and to be absent or present in very small amounts in the feces from breast-fed infants, we have investigated the question of the availability, as a food for infants, of the di-calcium phosphate present in cow's milk. We have fed a synthetic milk to infants, the only inorganic salt present in this food being di-calcium phosphate, and have recovered in the feces from 64 to 100% of the salt fed, the smaller recovery being from infants eight or nine months old, and the complete recovery from infants one to four months' old.

We have also shown that under ordinary conditions any excess of soluble calcium received in the food is precipitated in the intestines as calcium carbonate or insoluble calcium soaps, and is not available as a food, and that the addition of limewater to milk, although increasing the actual calcium content of the milk, really brings about a precipitation of insoluble calcium phosphate, leaving amounts of soluble and available calcium and phosphorus which are less than those to be found in breast milk. A child receiving modified milk to which limewater has been added may be receiving insufficient amounts of available calcium and phosphorus—a fact which should receive more attention in connection with the feeding of certain children, *i.e.*, rickets, spasmophilia, etc.

In connection with the use of cow's milk in infant feeding, it has been the general practice to consider the quantity of mineral elements present in this milk to be represented by the ash. This ash, amounting to about 0.7%, has usually been thought to contain all the mineral elements in the milk, and the figures obtained by analysis of such an ash have been quite generally accepted. Such an analysis does not, however, represent the true mineral content of milk, for under conditions ordinarily surrounding the determination of ash some of the sulphur and phosphorus in the casein molecule will be lost by volatilization. If this loss is taken into consideration, the true mineral content of cow's milk of average composition will be found to amount to 0.8% of the milk.

This point was brought out by the examination of several samples of milk, the figures in Table I being representative of data obtained from milks of average composition.

TABLE I. MINERAL ELEMENTS IN MILK AND MILK ASH.

	COW'S MILK		HUMAN MILK	
	IN ASH FROM 100 C.C. MILK	IN 100 C.C. MILK	IN ASH FROM 100 C.C. MILK	IN 100 C.C. MILK
	GM.	GM.	GM.	GM.
SO_3	0.025	0.054	0.002	0.004
P_2O_5	0.199	0.249	0.034	0.036
Cl	0.076	0.076	0.038	0.038
CaO	0.201	0.201	0.050	0.050
MgO	0.022	0.022	0.005	0.005
K_2O	0.145	0.145	0.086	0.086
Na_2O	0.074	0.074	0.020	0.020
	0.742	0.821	0.235	0.239
Oxygen equivalent to chlorine	0.017	0.017	0.008	0.008
TOTALS	0.725	0.804	0.227	0.231

A cow's milk giving an ash amounting to 0.725% will be seen really to contain miner elements to the extent of 0.804%, while human milk giving an ash amounting to 0.227% will be seen to contain mineral elements to the extent of 0.231%.

The incineration of milk leaves an ash in which the arrangement of the elements is altogether different from that in which they were present in the original milk. This is due to the fact that some of these elements are in part combined either with or within organic molecules.—part of the phosphorus being combined within the casein; all the sulphur being combined within the albumin and casein; some of the calcium being combined with the proteins; and part of the other bases being combined with citric acid to form citrates; and upon ashing these organic molecules are destroyed, the mineral elements involved being converted to oxides, and in the cases of the sulphur and phosphorus some may be lost by volatilization. The following statement of the forms in which the mineral elements are to be considered as being present in milk is given, as the result of extended studies of the chemistry of milk.

TABLE II. FORMS IN WHICH THE MINERAL ELEMENTS ARE PRESENT IN MILK.

ORGANIC COMBINATIONS	IN 100 C.C. COW'S MILK	IN 100 C.C. HUMAN MILK
	GM.	GM.
Sulphur within the casein and albumin	0.022	0.001
Phosphorus within the casein	0.022	0.001
SALT COMBINATIONS		
Calcium combined with the protein	0.054	0.024
Di-calcium phosphate, $CaHPO_4$	0.175	0.000
Mono-magnesium phosphate, $MgH_4P_2O_8$	0.103	0.027
Di-potassium phosphate, K_2HPO_4	0.230	0.000
Mono-potassium phosphate, KH_2PO_4	0.000	0.069
Potassium citrate, $C_6H_5O_7K_3$	0.052	0.103
Sodium citrate, $C_6H_5O_7Na_3$	0.222	0.055
Calcium chloride, $CaCl_2$	0.119	0.059
Iron	Trace	Trace
TOTAL SALTS	0.955	0.337

TABLE III. COMPARISON OF PERCENTAGES OF ASH, MINERAL ELEMENTS AND SALTS IN MILKS.

	COW'S MILK	HUMAN MILK
Ash	0.725	0.227
Mineral elements as oxides and chlorides	0.804	0.231
Salts (including the calcium of casinate	0.955	0.337

If we compare the totals given in Tables I and II we notice that the salt content of milk is considerably larger than the mineral or ash content. This is due to the citric acid of the milk appearing as citrates in the enumeration of the salts, while in the enumeration of the minerals these citrates appear as oxides of bases. In this connection it may be of interest to state that the sum of the fat, the sugar, the proteins and the ash never equals the total solids, for milk contains other substances which are not included in the determination of either the fat, the sugar, or the proteins, and are lost when the milk is ashed. The determination of any of these constituents by difference, therefore, throws an error of from 0.2% to 0.3% upon such determination. A milk containing 4.5% of sugar would show 4.7 to 4.8% if the sugar was determined by difference.

In view of what has been said in this paper, it may be of interest to know that the beneficial results obtained by the feeding of the Eiweissmilch or protein milk of Finkelstein is, without doubt, due to the fact that the available mineral content of this milk approximates very closely both the amount and form found in breast milk, for, notwithstanding the high ash content of protein milk (0.65%) half of this ash is present in the milk as insoluble calcium phosphate, a substance which is inert in so far as the metabolism of the infant is concerned.

DISCUSSION.

DR. HILL: I have followed Mr. Bosworth's work closely in the last year or two at the Children's Hospital, and I must say that I think he is absolutely on the right track in everything that he is doing. More difficult "feeding cases" are due to a chronic impairment of fat absorption than to any other cause, and this is brought about by the combination of the calcium of the cow's milk with the free volatile fatty acids present, forming insoluble calcium soaps, which cannot be absorbed, thus causing a great loss of calcium and of fat in the stools. A great many cases of rickets are undoubtedly caused in this way, and I believe that when we have more light on the chemical processes that bring about this difficulty of fat absorption, we shall be able to deal with our cases of malnutrition much more intelligently than we do now. At present it is true that we get good results in many of our cases of chronic fat indigestion, by simply cutting down the fat in the diet, and perhaps raising the other food elements to make up the calories. This, however, is begging the question; what we should be able to do is to feed such a milk to our babies that insoluble calcium soap formation will not go on, and this is the goal toward which all Mr. Bosworth's work points.

Mr. Bosworth: In connection with what Dr. Hill has just said, it may be of interest to you to know that the soap in infants' stools is calcium soap of palmitic acid, calcium palmitate being very insoluble. If you take the calcium out of the food of a child showing an intolerance for fat with a high content of soap in the stool, the soaps disappear entirely. A child giving off 15 grammes of soap in twenty-four hours will give off about 3/10 gramme of soap in the next twenty-four hours if the calcium is removed from the food.

Dr. Ladd: I would like to ask if there are any soluble calcium soaps?

Mr. Bosworth: The soaps of the lower fatty acids are soluble, and there is a degree of solubility, of course. Palmitic acid is the most insoluble of the fatty acids in cow's milk. This is due to the fact that the melting-point is high. The solubility and the melting-point are hitched up together in some way. The melting-point of palmitic acid is 62° C., quite a bit above body heat.

BASIC PRINCIPLES IN THE SYMPTOMATOLOGY OF BRIGHT'S DISEASE.

By H. Elwyn, M.D., New York City.

In reading current literature on Bright's disease we are confronted with the description of a multiplicity of types. There is the hypertensive type and the non-hypertensive type, the nitrogen-retention type, the sodium-chloride-retention type, etc. All these descriptions have this fundamentally wrong with them,—that they attach too much importance to a single symptom, without emphasizing the uniform principle practically underlying all cases of Bright's disease.

In studying diffuse kidney diseases there are the three elements of the kidney which we have to consider, namely: tubules, glomeruli and vessels of the kidney. Volhard and Fahr, in their remarkable monograph on Bright's disease, have well demonstrated that each of these elements, when diseased, will produce a characteristic symptom-complex, and that we can well infer, from the symptoms presented, the exact histological picture of the diseased kidney; and this without the aid of dye tests, mathematical formulae and other cumbersome procedures.

As prolegomenon to correct understanding, we have to consider what is the essential function of the kidneys; what is meant by a sufficient kidney and by an insufficient kidney; what elements are involved in kidney insufficiency; what is the compensatory mechanism, and finally what is the ultimate result of kidney insufficiency.

The function of the kidney is to excrete the waste products of metabolism. Of the various waste products, the non-protein nitrogenous substances, chiefly urea, form the most important elements. The necessity of their excretion is a matter of life or death. Inability to excrete them invariably leads to death in a short time, after a certain amount has accumulated in the body tissues. Not so with the mineral salts. Retention of sodium chloride may last for months; it favors edema, water retention and cardiac insufficiency, but is never the immediate cause of death.

We may consider, then, as the *essential function* of the kidney, the elimination from the body of the nitrogenous substances in the form of the non-protein nitrogen, and, indirectly, the maintenance of a normal level of the so-called rest nitrogen in the blood. This level, Folin and his co-workers have definitely proven to be, in normal health, 23 to 27 mgm. per 100 cc. of blood. The excretion of these products is effected in a solution, which the kidney can either concentrate to a high degree, so as to save fluids for the body, or eliminate in a very low dilution with a sufficient quantity of fluid intake. We can measure this ability of the kidney to concentrate by the specific gravity of the urine, which reaches, with a normal kidney, to above 1040. This ability to concentrate or dilute, according to needs, we call the *variability of kidney functions*, and it forms the essential means of the proper functioning of every normal kidney.

By a sufficient kidney, we mean a kidney that is able to eliminate the essential waste products under a variety of conditions with a variability of function. And we mean by an insufficient kidney one which loses this variability of function, and must either use a compensatory mechanism to help eliminate the waste products, or else fail to do so, entirely.

Variability of kidney function is dependent entirely upon the integrity of a sufficient number of glomeruli, and reduction of the functional capacity of the glomeruli to a sufficient degree, by inflammation or chronic obliteration, will result in a gradually increasing loss of this variability of function. The result is a urine of low dilution, and in order to excrete all the waste products, the kidney must excrete continuously of this greatly diluted urine. But water excretion is dependent on glomerular function, and with the reduction of glomerular function, water excretion is impaired. The only thing that the kidney can do is to force enough water through those glomeruli that are still functionally capable, and it does this by raising the pressure in the glomeruli and, of course, in the whole arterial system.

The compensatory mechanism, then, consists in hypertension and increased diuresis of a hyposthenuric urine. Obliteration of the glomeruli to a point where, with hypertension and increased diuresis, the kidney fails to eliminate all nitrogenous waste substances, will result in an increase of the rest nitrogen level in the blood, progressive to a degree where death results. The same will result when the blood pressure falls, for any reason, to a degree where the compensatory mechanism breaks down.

By taking the specific gravity of the urine over a prolonged period of time, we can well establish the variability of which the kidney is capable. By giving the patient an additional water intake, we can see how promptly it is excreted, and by placing him on an absolutely dry diet, how high he can raise the specific gravity of the urine. Increased amount of rest nitrogen in the blood always means manifest kidney insufficiency, capable of returning to normal when the glomeruli are acutely inflamed, but always progressive where the glomeruli are permanently obliterated.

With these considerations let us review the various forms of diffuse kidney disease.

In acute diffuse glomerulo-nephritis we have a condition in which all the glomeruli are hit. The causal agent is always bacterial in origin, with the streptococcus in the lead. Although all the glomeruli are involved, they are not equally so, and side by side with bloodless, swollen glomeruli, with proliferation of cellular elements, there are glomeruli whose capillaries still contain blood and are, in a measure, functionally capable. Applying our tests for kidney insufficiency, we find that variability of function is diminished in proportion as the glomeruli are affected, and that retention of non-protein nitrogen in the blood is in inverse proportion to the ability of the compensatory mechanism to maintain diuresis through the less affected glomeruli.

As an expression of acute inflammation there is hematuria. This in diffuse kidney lesions is always a symptom of acute glomerular involvement. With the blood in the urine there is always slight albuminuria and cylindruria. Cases of acute diffuse glomerulo-nephritis are hardly ever pure, and nearly always there is a secondary tubular degeneration which expresses itself, clinically, by generalized edema, cavity hydrops of a pseudochylous transudate, marked albuminuria and cylindruria.

The clinical picture of acute diffuse glomerulo-nephritis, as we see it, is, therefore: a hemorrhagic urine with some albuminuria and cylindruria; an increase in blood pressure as an attempt of the compensatory mechanism to maintain normal diuresis. If the inflammation is very slight and there is sufficient glomerular functional power to maintain the essential function of the kidneys, there will be no rest nitrogen retention in the blood, and practically the only symptoms presented, besides the urinary findings, will be a concentration ability of probably not above 1025, and an increase in blood pressure of perhaps 20 to 30 mm. of mercury above the normal. This, also, is often the picture in an inflammation which is beginning to recede.

With a severe inflammation, concentration ability hardly rises above 1018 to 1020, and although the compensatory mechanism of hypertension may result in a systolic blood pressure of 180 to 200 mm. of mercury, there is still so great a loss of glomerular functional power, that the essential function of the kidney cannot be maintained, with the result that the rest nitrogen level in the blood is increased and may exceed 80 and 100 mgm. per 100 cc. of blood.

In most of these cases of acute diffuse glomerulo-nephritis *restitutio ad integrum* is possible. The indication for treatment is: rest in bed till all signs have disappeared, a minimal protein intake, and a salt-free diet if edema is present. A gradual fall in blood pressure and of the rest nitrogen level in the blood, an increased concentration ability, together with the disappearance of blood from the urine, are the signs of betterment. Usually the blood pressure is last to return to normal, and in this connection a knowledge of the individual is important. In an individual who before the attack of acute nephritis has been carrying a blood pressure of 150, we should not expect to have it return to a lower level with the subsidence of the acute attack.

There is really nothing in kidney pathology that one can confuse with this picture. For in cases of focal nephritis or of the embolic glomerulo-nephritis of streptococcus viridans endocarditis, where the hematuria indicates acute glomerular lesions, although conceivable, there is practically never any kidney insufficiency, and therefore no loss of functional variability, no increase in blood pressure, no increased rest nitrogen in the blood.

If the kidney does not recover completely it passes into a chronic diffuse glomerulo-nephritis, in which functional activity is dependent either upon the glomeruli which have recovered completely or upon those which, having undergone chronic inflammatory changes, are still capable of functional activity. Loss of variability of function is a manifest symptom of kidney rest diuresis. The kidney remains sufficient and a normal level of rest nitrogen in the blood is maintained as long as a sufficient quantity of urine of low dilution can be excreted by this kidney rest with the aid of the compensatory mechanism of hypertension. As long as the kidney is able to do this we may call this the latent stage of chronic diffuse glomerulo-nephritis, to distinguish it from the last stage when the kidney is manifestly insufficient.

We have, then, as the clinical picture of the latent stage of chronic diffuse glomerulo-nephritis: hypertension of 200 to 250 mm. of mercury; polyuria; a concentration ability of about 1020 on a dry diet; a slow elimination of an increased water intake; excretion of all of an extra sodium chloride intake, but over a prolonged period of time and in a urine of low dilution; a trace of albumen in the urine and a normal level of rest nitrogen in the blood.

There is only one other clinical picture for which this stage of nephritis can be mistaken, namely: arteriosclerosis of the kidney, in which the finer and often the finest vessels are involved. The condition is known under various names, as the granular kidney, benign hypertension, simple kidney sclerosis (Volhard and Fahr). It presents, clinically, hypertension reaching 200 mm. of mercury and above, polyuria, nycturia, with traces of albumen in the urine. But in this condition there is no loss of variability of function, ability to concentrate is retained and is very high on a dry diet. An increased water intake is promptly eliminated. The polyuria and nycturia are dependent not upon a kidney rest diuresis, but upon a latent edema due to the relative insufficiency of a hypertrophied heart muscle, which again is the result of prolonged hypertension. This can be well shown by placing the patient on a salt-free diet with a limited water intake and also with absolute rest in bed. The polyuria and nycturia will rapidly diminish and often disappear entirely. In this condition the glomeruli are not diesased at all, the primary condition is that of hypertension, dependent upon changes in the finer vessels of the kidney.

The kidney in the latest stage of chronic diffuse glomerulo-nephritis is prone to acute exacerbations, resulting in a fresh hematuria, diminished diuresis and rest nitrogen retention in the blood. A careful anamnesis and close observation will often establish the latent chronic nephritis previous to the acute exacerbation. Again, we must not consider every case of acute symptoms in an elderly individual with high blood pressure as an acute lighting up of a previous chronic nephritis. This is very important with a view to prognosis.

The latent stage of chronic glomerulo-nephritis may last only a few months, or it may be prolonged over a period of many years. Its course is always progressive, and the clinical cases present a variety of transition forms tending towards the stage of manifest kidney insufficiency. Occasionally we meet with borderline cases, between the latent and the manifest, especially in individuals who have suffered from gout or have been lead workers, in which the rest nitrogen is often 50 to 60 mgm. per 100 cc. of blood. In such borderline cases a non-protein diet will restore nitrogen level in the blood, and prove that the kidney rest is still capable to maintain the essential function of the kidney, if not subjected to too much strain.

As the chronic glomerulo-nephritis progresses towards its terminal stage, we have manifest kidney insufficiency. As the kidney rest is reduced and its functional capacity diminished more and more, we have practically a total loss of functional variability. Concentration of urine remains fixed at 1006 to 1014. The compensatory mechanism of increased diuresis, although continuously at work night and day, is unable to eliminate the nitrogenous waste products of metabolism, at a minimal non-protein food intake or even at a total absence of protein in the food. The result is a gradually increasing level of rest nitrogen in the blood to a degree where symptoms of poisoning are produced, the figures before death often reaching 300 mgm. per 100 cc. of blood.

Blood pressure is excessively high, often reaching 275 to 300 mm. of mercury. Insufficiency of the hypertrophied heart muscle will complicate the clinical picture. There may be a fall in blood pressure and with the breaking down of the compensatory mechanism of hypertension the quantity of urine will be diminished, and with the increase of rest nitrogen in the blood death will quickly follow.

With the gradual increase of rest nitrogen in the blood there is added the picture of true uremia, that is, of retention of the constituents of the urine in the blood, of the grand azotemia of Widal. The symptoms of true uremia are remarkably uniform. Beginning with anorexia, dyspeptic phenomena of vomiting, thirst and diarrhoea, there is a gradually increasing weakness and feeling of fatigue, apathy passing into drowsiness and stupor. This is accompanied by a characteristic restlessness and increased irritability of the muscles of the extremities, but never developing into convulsions. There is subsultus tendinum. Stupor finally passes into coma in which the pupils are contracted, the reflexes are increased, but there is no Babinski. Respiration is deep and slow, characteristic of states of acidosis. Pericarditis is often present the last few days.

Albuminuric retinitis is as a rule present in most cases in the terminal stage of chronic nephritis. It is often an early sign when the insufficiency of the kidney is still slight. It is never a sign of acute glomerulo-nephritis nor of the second latent stage of chronic glomerulo-nephritis but always a symptom of beginning manifest kidney insufficiency.

In tracing the sufficiency or insufficiency of a kidney through the various stages of glomerular injury, there is one complication of acute glomerulo-nephritis which we have to consider, namely: eclamptic convulsions. Convulsions do not belong to the picture of pure nephritis in any of its stages, and they practically never occur in the second latent stage or in the third terminal stage, but they are always a complication of the acute stage or of an acute exacerbation in the chronic stage. Acute diffuse glomerulo-nephritis may run without this complication throughout the entire course or may develop convulsions at any time. We do not know the causal mechanism, and the best explanation we can give is the old one of "brain swelling," of extracellular and intracellular edema of the brain centers. To classify a cerebral edema type of uremia, as is done by a recent author, is entirely wrong, as this is only an occasional complication of acute nephritis and is never dependent upon actual kidney insufficiency.

We have mentioned so far the various forms of glomerulo-nephritis and have classified them into: an acute diffuse glomerulo-nephritis, a latent stage of chronic diffuse glomerulo-nephritis, and a terminal stage of chronic diffuse glomerulo-nephritis. We have also mentioned focal glomerulo-nephritis and embolic glomerulo-nephritis as not causing any kidney insufficiency and, therefore, no increase in blood pressure, no loss of variability of function and no increase in the rest nitrogen level in the blood.

In considering tubular involvement there is a good deal of dispute whether to use the term "nephritis" in connection with it or not. Aschoff insists upon the use of the term "tubular nephritis," while others, because of the purely degenerative character of the injury, refuse the use of this term. Fr. Muller has coined the word "nephrosis" for it, which is gradually finding acceptance by German writers.

Purely tubular injury without any glomerular involvement is characterized by marked albuminuria, cylindruria, edema and hydrops of the serous cavities. There is salt retention with the edema, whether because of the edema we do not know. Nor do we know the causative mechanism of the oedema. There is no increase in blood pressure, no loss of concentration ability, no increased rest nitrogen in the blood and no hematuria.

Such forms of pure tubular degeneration or nephrosis are found in the course of chronic suppuration, in tuberculosis, syphilis, diphtheria, and occasionally in other general infections. In many cases no etiology can be discovered. They may be complicated with amyloid deposit, which does not change the clinical picture.

As a special form of nephrosis, we must consider the pregnancy kidney. Here the clinical picture is complicated with eclamptic convulsions and increased blood pressure, which does not stand in any causal relation to the kidney affection, but is probably the result of the same poison causing the tubular degeneration in the kidney.

A nephrotic kidney without glomerular involvement is never a cause of death. When death occurs it is due to the causative disease or to some intercurrent affection. Convulsions never occur in pure nephroses.

Prognosis depends on the causative disease. Those of unknown etiology may last many years. Treatment is, of course, directed towards the etiological disease, and the edema and cavity hydrops can be controlled remarkably well by a salt-free and a dry diet.

As a special form we must also consider the sublimate kidney. In this condition, instead of a degeneration of tubules we have complete necrosis of tubules. The glomeruli are not affected. Clinically the mild cases are characterized by oliguria, marked albuminuria and cylindruria. In the severe form of bichloride poisoning, there is complete anuria, and with it retention of all the nitrogenous waste products in the blood, increase in blood pressure and the other signs of true uremia in so far as they are not overshadowed by other symptoms of mercury poisoning.

We may classify, therefore, tubular nephritis, or nephrosis, into: acute tubular nephritis or nephrosis, and chronic tubular nephritis or nephrosis, both with or without amyloid deposit, and the special form of necrotic tubular nephritis or nephrosis, of which the sublimate kidney is the prominent example.

Of the affections of the vessels of the kidney we have mentioned arteriosclerosis of the finer vessels, the commonest kidney affection, and presenting the well-known syndrome of hypertension with a sufficient kidney. There is no loss of variability of function, no loss of concentration ability, no increase of rest nitrogen in the blood. The symptoms are mostly cardiac, due to the relative insufficiency of the hypertrophied heart as a result of prolonged hypertension. Prognosis is good. The patient may carry his hypertension for twenty years, with periodical cardiac decompensation, which responds promptly to rest in bed, a dry and salt-free diet and digitalis. Death is usually due to cerebral hemorrhage or some other affection.

Lastly we must consider the other form of kidney sclerosis in which there is an arteriosclerosis of the finer and finest vessels, including the vasa afferentia of the glomeruli. To this there is added a glomerulo-nephritis, not involving all the glomeruli but rather focal in type, not of bacterial origin, but of unknown etiology, probably the result of toxins produced in the body. Volhard and Fahr have termed this the combination form, or malignant hypertension. To the symptoms of hypertension there are added here the symptoms of nephritis and kidney insufficiency, a blood pressure of 200 and above, complete loss of variability of function, specific gravity of the urine, practically fixed, of about 1006, a gradually increasing rest nitrogen level in the blood, with the final symptoms of true uremia. There are various arterial symptoms due to arterial changes in the brain and elsewhere. Albuminuric retinitis is an early manifestation.

Prognosis is always bad. This form of malignant sclerosis always leads to death as a result of kidney insufficiency.

With these two forms of kidney sclerosis, namely, the benign sclerosis of kidney vessels or benign hypertension, and the malignant form of kidney sclerosis or malignant hypertension or combination form, we have classified practically all the various forms of Bright's disease.

It is at once evident that the classification of Bright's disease in this manner, and a knowledge of the principles underlying their individual symptomatology, give us a better view of the prognosis and definite indications for treatment. For this we are indebted to the epochmaking work of Volhard and Fahr, a book that should be read by everyone interested in kidney disease.

AN EPIDEMIC OF DYSENTERY AT THE BOSTON STATE HOSPITAL, DUE TO A MEMBER OF THE PARATYPHOID-ENTERITIDIS GROUP.

By Mary Elizabeth Morse, M.D., Boston,
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and
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[From the Laboratory of the Boston State Hospital.]

(*Concluded from page 220*)

The results of the agglutination tests with both human and rabbit sera illustrate well the group reactions, but further than that, are very difficult, or even impossible, to evaluate, in view of the complexity of agglutination reactions within the group. The outstanding result is that the present organism is not an ordinary *A* or *B*. It does not react to any extent, either, with antienteritidis or antisuipestifer serum, although its immune serum agglutinates both organisms. The high reactions with B. enteritidis should probably be discounted to some extent because of the easy agglutinability of the strain.

As to the place of the present organism within the paratyphoid group, it is impossible to say anything more definite than that it is not an ordinary A, B. enteritidis or suipestifer, but that, according to agglutinative affinities, it resembles the three latter more than *A*. It does not fit well into either of the chief divisions of the group as outlined by Sobernheim and Seligmann.[15] It might probably be considered as one of the C types.

IX. PATHOLOGY.

Autopsies were obtained on two cases in the spring epidemic of 1915, also on a patient who recovered from a severe attack and died five months later of other causes, and two cases of the milder form of the disease which prevailed in 1916.

The two acute virulent cases presented similar pathological pictures. The chief conditions found were: first, an acute fibrinous ileitis and colitis, from which an almost pure culture of the organism was obtained; second, a septicemia, the bacillus being isolated in pure culture from the heart's blood; third, cloudy swelling of the liver, with focal necroses in case 2; and fourth, a pneumonia of the septic type, with miliary abscesses and large areas of necrosis, from which the organism was recovered, associated with streptococci.

The intestine presented a striking appearance. The lesions began a short distance above the ileocaecal valve, involved the entire colon, and in the first case, the rectum also. The intestinal wall was thickened and covered with irregular patches of dirty yellow-gray exudate, interspersed with bright-red mucosa, frequently showing foci of hemorrhage. The membrane could be scraped off, leaving an eroded hemorrhagic surface. There were no ulcers and only very moderate swelling of Peyer's patches. The regional lymph-nodes were enlarged and injected. Microscopically the intestine showed a necrosis extending inward for varying distances, sometimes converting the entire mucosa into a fibrinous membrane. The latter had sloughed in various small areas, exposing the extremely edematous submucosa. The exudate was composed of lymphoid and plasma cells; polymorphonuclears where fibrin was present, and large phagocytic endothelial cells. The latter were present in some sections in considerable numbers but were not as abundant as in the intestinal lesions of typhoid fever.

The pneumonic exudate was characterized by phagocytic cells, similar to those in the intestine, but more numerous. Small numbers were also found in the mesenteric lymph-nodes, but none in the liver.

Condensed summaries of the protocols are as follows:

Case 1. R. K. (A-15-23) aged 50. A much demented case of Korsakow's psychosis, in hospital two years. Died on fifth day of dysentery. Autopsy five hours post mortem. Body well built, well nourished. Body heat and rigor mortis present.

Ventral Section. Small amount of free fluid in pelvic cavity.

Thorax. Recent adhesions over posterior portions of each lung. No excess of fluid in pleural cavities.

Heart. Weight 300 gms. Valves normal. Myocardium somewhat friable and endocardium gray. The descending branches of both coronaries show occasional plaques.

Lungs. Right: Weight 295 gms. Posterior portion is markedly congested. Remainder of lung is normal. Left: weight 570 gms. The upper part of the upper lobe is normal. The inferior portion of the upper lobe and the entire lower lobe are enlarged, deep red, firm and nodular. Cut surface is consolidated, reddish purple and is beset with dull gray foci ½ mm. in diameter, sometimes depressed in the centre. A large amount of thin purulent fluid can be expressed from the tissue.

Bronchi are deep red and covered with purulent fluid.

Abdomen.

Spleen. Weight 105 gms. Firm, purple-red on section. Malpighian bodies just visible.

Liver. Weight 1450 gms. Capsule normal. Cut surface shows a yellow-brown mottling with indistinct lobulation. Consistence soft.

Gall Bladder. Distended; no stones or adhesions.

Gastro-intestinal Tract. Stomach, duodenum, jejunum and upper ileum negative. The lower third of the ileum is thickened and edematous. The mucosa is swollen and red, and is irregularly covered with a granular yellow-gray exudate. From cecum to anus the intestinal wall is edematous, and the mucosa is covered with a shaggy membrane which follows the rugae. On scraping off the membrane a hemorrhagic and eroded surface presents. No ulcers found.

Lymph Nodes in the vicinity of the cecum are enlarged, soft and grayish pink.

Pancreas shows some injection; otherwise negative.

Kidneys. Combined weight 290 gms. Capsules are thickened. Cortex measures from .2 to .6 mm.; is gray, with areas of injection. Pyramids dark red with a white streak at the bases.

Adrenals show central softening; otherwise not remarkable.

Bladder. Negative.

Uterus. Pedunculated myoma, 1 cm. in diameter, on posterior surface.

Retroperitoneal Tissues. Negative.

Organs of the Neck. Negative.

Head. Calvarium, thick. Dura not adherent; is moderately thickened along the longitudinal fissure. Sinuses negative. Pia thickened on inferior surface of cerebellum; not elsewhere.

Brain. Weight *in toto* 1350 gms. Marked atrophy of the convolutions of the frontal, central and parietal regions, most prominent in the frontal fields, and decreasing posteriorly. Consistency of the brain is everywhere increased.

Microscopical Examination.

Lungs. Section through one of the pneumonic areas. These are situated around fairly large vessels. At the edges of the lesion the capillaries are distended. In the centre of the focus the alveoli are filled with cellular exudate mixed with considerable fibrin and serum, and there are small areas of hemorrhage. The exudate consists of polymorphonuclear leukocytes and large phagocytic cells. The latter often reach large size (five or six times the diameter of a red corpuscle), have a coarse-meshed cytoplasm, and contain red corpuscles, pigment and polymorphonuclears. Three or four of these cells are often present in a single alveolus. In several places the alveoli are filled with solid masses of bacteria. The alveolar partitions are frequently dissolved in the centre of the consolidated areas. The large veins show very marked inflammation. Sections through the abscesses show extensive foci of necrosis with masses of bacteria and fibrin in the centre, surrounded by a zone of degenerated leukocytes. The bronchioles are intensely affected, the epithelium being absent, the walls infiltrated with fragmented leukocytes and the normal structures obscured.

Heart. Perinuclear pigment prominent; otherwise nothing notable.

Liver. The liver cells are indistinct in outline; their cytoplasm stains a dull granular pink, and the nuclei are pyknotic or stain faintly. Fat content is very moderate. Collections of lymphocytes about the bile ducts are frequent, and the sinusoids are dilated. No necroses or phagocytic cells.

Spleen. Lymphoid tissue is small in amount. Pulp contains much blood and collections of golden brown pigment. No phagocytes.

Gastro-intestinal Tract. Stomach: Nothing noteworthy. Intestine: Sections from various parts of the lower ileum and the colon show the following picture: At the edges of an affected area there is a superficial necrosis with fibrin network. The underlying blood vessels are engorged, the glands choked with desquamated epithelium and debris and the mucosa thickly infiltrated with polymorphonuclears. The submucosa is extremely edematous and is infiltrated with lymphocytes, plasma and large phagocytic cells, similar to those found in the lung. The vascular endothelium is swollen and the vessel walls infiltrated. Large numbers of bacilli are scattered free throughout the mucosa and submucosa. The muscularis contains clumps of large phagocytic cells situated about the vessels. In more advanced areas the necrosis extends deeply into the mucosa, and the submucosa shows areas of hemorrhage and a moderate infiltration of polymorphonuclears. The vessels in the necrotic areas are frequently filled with thrombi of fibrin and leukocytes. In the most advanced portions the entire mucosa is converted into a membrane of necrotic tissue, fibrin, polymorphonuclear leukocytes and masses of bacteria. The membrane has sloughed in numerous areas, exposing the submucosa. The necrosis and sloughing is irregular in distribution and depth. The lymphoid tissue is not hyperplastic.

Mesenteric Lymph Nodes. No hyperplasia of lymphoid tissue. Large endothelial cells, phagocytic for lymphocytes and red corpuscles are very numerous.

Adrenals. The cortical cells stain well in general and are much vacuolated. Small collections of lymphocytes with a few plasma cells in the reticulosa.

The other organs showed nothing of note. The brain and cord revealed no lesions which could be correlated with the acute infection, and the description of them is, therefore, omitted.

Cultures.

Heart's Blood. Epidemic organism in pure culture.

Consolidated Area of Lung. Epidemic organism plus a few colonies of streptococci.

Wall of Cecum. Epidemic organism in abundance on Congo red plates.

Lymph Node near Cecum. No growth for three days, then scattered colonies of staphylococcus albus and streptococci.

Cerebro-spinal Fluid. Sterile.

Anatomical Diagnosis. Acute membranous ileitis and colitis, septicemia, septic pneumonia with abscess formation, acute fibrinous pleuritis, purulent bronchitis, cloudy swelling of liver, myoma uteri, cerebral atrophy.

Case 2. E. H., aged 63 (A-15-24) paranoid dementia praecox. Hospital residence three years. Died on the eighth day of illness. Autopsy 26 hours after death. Body of a somewhat obese woman. Some distention of abdomen.

Ventral Section. Omentum contains much fat, and in its lower third is adherent to the peritoneal wall. Spleen is bound down by adhesions. No free fluid in peritoneal cavity. The intestines are injected, especially the ascending, transverse and descending colon. Subserous hemorrhages are visible in the cecum.

Thorax. A few light adhesions over the posterior portion of the left base; otherwise the pleural cavities are free and contain no excess of fluid. Pericardial sac contains a slight excess of fluid.

Heart. Weight 450 gms. Epicardial fat abundant. Slight thickening of the edges of the tricuspid and the bases of the aortic valves. Myocardium flabby. Right coronary shows a few small plaques.

Lungs. Right, weight 550 gms; left, 530 gms. Both lungs show scars at apices. Upper lobes not remarkable. The posterior portion of the left lower lobe is enlarged, bluish red and firm. Tissue sinks in water, and, on section, discloses an evenly consolidated red surface with multiple clusters of yellow dots, 3 mm. in diameter, arranged around the bronchioles. The right lower lobe is consolidated but does not show miliary abscesses.

Peribronchial Lymph Nodes moderately enlarged.

Spleen. Weight 70 gms. Trabeculae faint; pulp bright red; Malpighian bodies small.

Liver. Weight 2000 gms. Is adherent to the diaphragm. Shape and capsule not remarkable. Cut surface is yellowish red, and normal markings are indistinct. Consistence soft.

Gall Bladder. Distended; otherwise not notable.

Gastro-intestinal Tract. Esophagus markedly injected. Stomach contains fecal material. The intestine is negative to within 6 cm. of the ileocecal valve. The mucosa of the remaining portion of the ileum is thickened, injected and granular. From the ileocecal valve to the splenic flexure the wall is thick and stiff and the mucosa shows areas of membrane and erosion, but these are not as extensive as in Case 1. The descending colon is less involved and the rectum is comparatively free. No swelling of the lymphoid tissue.

Kidneys. Combined weight 320 gms. Capsules strip easily. Cortex is 6 to 7 mm. in depth and is gray, with foci of injection. Glomeruli not visible.

Adrenals. Markedly softened.

Bladder. Mucosa is granular and injected at the trigone. Urine cloudy.

Uterus. Cavity contains a small amount of turbid fluid.

Calvarium. Of moderate thickness with small amount of diploe. Dura is adherent to inner table. Pia is lifted from the brain surface by a large amount of fluid; is of normal thickness.

Brain. Weight *in toto* 1440 gms. Convolutional pattern is simple. No atrophy. Consistence is uniformly increased over the dome. Structures at base negative. Basal vessels free from sclerosis.

The *microscopic findings* in the lungs and intestine were similar in all particulars to Case 1, and need not be detailed. The liver showed foci of necrosis, and there was also a chronic thyroiditis.

Cultures. The organism was recovered in pure culture from the heart's blood and urine and, in large numbers, from the wall of the colon. In the lung it was associated with staphylococcus albus and aureus.

Anatomical Diagnosis. Acute membranous ileitis and colitis, septicemia, septic pneumonia with miliary abscesses, focal necroses of the liver, acute fibrinous pleuritis, cardiac hypertrophy and dilatation, chronic fibrous endocarditis, mitral and aortic, acute cystitis, subpial edema.

Case 3. E. McK., aged 76 (A-15-41) showed conditions four months after recovery from a severe attack.

The patient, a senile dement, died of bronchopneumonia, chronic interstitial nephritis and general arteriosclerosis. The intestine, to within a foot of the ileocecal valve, was normal. Throughout the remainder of the bowel were numerous foci of injection in the mucosa, in some places limited to the crests of the folds, in others spread over several centimeters of the mucosa. The mucosa was not thickened, the lymphoid tissue not increased, nor were there signs of healed ulcers. Mesenteric lymphnodes small. The gall bladder contained dark, viscid bile and the lining was not remarkable.

Microscopically, in the injected areas of the intestine the superficial epithelium was absent, and near the surface of the mucosa were numerous large vacuolated mononuclear cells, occasionally containing the remnants of red corpuscles. The mucosa also showed numerous plasma cells and a few eosinophilic leukocytes. The outer coats of the intestine were normal.

Cultures from the intestinal wall, feces, mesenteric lymph nodes and bile did not yield the epidemic organism.

Cases 4 and 5 show the condition of the intestine a few days after an attack of moderate severity. Both patients had blood and mucus in the stools, and died several days after the height of the attack. In both, also, the dysentery was merely the terminal event in the course of organic conditions fatal in themselves.

Case 4. (A-16-21) was a bed ridden paretic. The mucosa of the lower ileum was slightly thickened and moderately congested. The mucosa of the upper half of the large intestine was uniformly congested but not thickened. In the lower half of the large intestine the wall was moderately thickened and the mucosa dull gray and granular, with patches of congestion but no membrane or loss of substance. The feces in the lower intestine were fluid, gray, slightly frothy, not offensive. Microscopically there was a loss of superficial epithelium and masses of bacteria in the glands, but practically no cellular reaction and no changes below the mucosa.

Case 5. (A-16-24) was a senile dement who had an advanced chronic myocarditis and an internal hemorrhagic pachymeningitis. The mucosa of the cecum was hemorrhagic, and from there on through the rectum the wall was moderately edematous, showed large areas of congestion and, in places, also prominent mucous glands. The lesion was most marked in the sigmoid and upper part of the rectum where the entire mucosa was velvety and dusky. Feces were soft and yellow. Sections showed some slight superficial necrosis, some small localized losses of substance extending into the submucosa, moderate edema of the latter, and considerable swelling of the lymphoid tissue. An occasional phagocytic endothelial cell was found, also moderate numbers of neutrophilic and quite numerous eosinophilic polymorphonuclears.

The organism was isolated in pure culture from the heart's blood of this case.

It is evident from the last two autopsies that in the cases of moderate severity there is nothing striking or characteristic about either the gross or microscopic picture, of the intestine, as there is in the virulent cases, but the conditions are such as might be found in any mild inflammation of the bowel.

Pathologically, the acute fatal cases differ obviously from bacillary dysentery in the presence of a septicemia and pneumonia, as well as in the absence of intestinal ulcers. The invasion of the blood stream, particularly, allies the disease with paratypoid infection. The intestinal lesions, as well as the course of the disease, are more acute and violent than those of bacillary dysentery.

The pathological anatomy of paratyphoid infections is incompletely known, as until recently comparatively few autopsies had been done on either the typhoid or gastro-enteric forms. Since the outbreak of the war autopsy reports have been accumulating. In general the results are that paratyphoid has more tendency to involve the large bowel than does typhoid; that the lymphoid tissue of the intestine is only moderately affected; that ulcers are frequently absent, and when present, are usually scattered and small. The histology of the lesions appears not to have been especially considered. Job and Ballet[16] give the findings in four cases of paratyphoid fever (one *B* and 3 *A*) as intense congestion of the viscera, a moderate degree of inflammation of Peyer's patches without ulceration; swelling, infiltration and congestion of the abdominal lymph glands, and intense inflammation of the spleen, with lymphoid infiltration and hemorrhage.

As to the dysenteric form, Stollkind[4] says that 10 cases with lesions similar to dysentery have been reported. Korczyski[5] found in the enteric form of his cases acute hyperemia of the jejunum and ileum, hemorrhage into the mucosa and occasional small ulcers; in the dysenteric form the same changes, with the addition of an inflammatory process in the large intestine, with thickening of the mucosa and ulcers, which could scarcely be distinguished from Shiga dysentery. He did not find extensive necrosis.

In the gastro-enteric form, the most acute cases may show no microscopic lesion except punctiform hemorrhages through the entire gastrointestinal tract.[3] In more prolonged cases there may be swelling of the lymphoid tissue, ulceration, and even gangrene of the intestine. The majority of the few reported autopsies on cases dying a week or more after onset have shown hemorrhagic inflammation of the ileum, hyperplasia of the lymphoid tissue and frequently ulcers.

None of these conditions agrees with the virulent form of the present disease, which is an acute extensive membranous inflammation of the lower ileum and the colon without gross ulceration or hyperplasia of the lymphoid tissue, and combined with septicemia and pneumonia of the septic type, characterized by large areas of necrosis.

The finding of streptococci in the urine of two cases and in the lung of one case, combined with the epidemic organism, suggests that in fatal cases this may be a secondary complication of importance.

As to a possible relation of the disease to hog cholera, we have no crucial evidence, having failed to isolate an identical bacillus from the hog cholera animal. One is struck, however, by certain points of similarity in the pathology of the present disease and that of hog cholera, particularly the simultaneous involvent of the intestines and the lungs. The intestines in hog cholera may present various appearances—from simple catarrh to hemorrhagic or diphtheritic inflammation. The most frequent form of pulmonary involvement is an acute fibrinous necrotic pneumonia. Organisms of the paratyphoid group are most frequently found in the lungs and spleen. Uhlenhuth and Handel[17] bring up the question whether there may not be two diseases included under hog cholera, one, very contagious, caused by an ultra microscopic virus, and a second, slightly contagious, by B. suipestifer.

X. ANIMAL EXPERIMENTATION

The pathogenicity of the organism was tested on rabbits weighing from 1800 to 2000 gms., by both intravenous and subcutaneous inoculation and by feeding experiments.

One tenth of a cubic centimeter of a 24 hour broth culture of a freshly isolated strain given subcutaneously produced no symptoms at the end of three days. There was no local reaction, and the animal was lively and ate well.

Two tenths of a cubic centimeter of a 24 hour broth culture intravenously killed an animal over night. The most striking lesion at autopsy was an extensive necrosis of the liver Other changes were cloudy swelling of the myocardium and renal epithelium, and diffuse degenerative changes in the cortical nerve cells. The gastro-intestinal tract was negative.

Another rabbit, which in the beginning of the experimentation was given a massive dose of the organism intravenously (.1 ccm. of a moderately thick suspension of a 24 hour agar culture) died over night, showed the above mentioned lesions, in heart, liver, kidneys, thymus and brain, and in addition, hemorrhage into the small intestine. The intestinal mucosa was thick, velvety, and deep red. The bacillus was isolated from the blood and bile, but not from the hemorrhagic intestinal contents.

A fourth rabbit was fed 1 cc. of a 24 hour bouillon culture on carrot once a day for three successive days, after which it was fed sparingly on lettuce and carrots once a day. It remained lively, ate well, had no diarrhea, and its temperature was not abnormally high or irregular. It, however, emaciated rapidly and on the eighth day suddenly died. Autopsy showed an atrophic condition of liver and spleen. The mesenteric lymphnodes were enlarged, soft and of a deep red color. The gastrointestinal tract was not remarkable macroscopically, and the feces were normal. Microscopically, however, there was found at several points in the small and large intestine a necrosis of the superficial epithelium. The surface in these areas was covered with a thick layer of degenerated cells, mingled with masses of bacteria and scattered polymorphonuclear leucocytes. Numerous plasma cells were present in the underlying mucosa, but the remainder of the intestinal wall was negative. There was hemorrhage in the centers of the enlarged lymph nodes; the lymphoid tissue was active; small numbers of mononuclears, phagocytic for lymphocytes, were present, and a large amount of pigment, both intra- and extra-cellular. The liver showed areas of hemorrhage, but no cloudy swelling or necrosis. The spleen contained numerous endothelial cells, phagocytic for pigment. The other organs were not remarkable. Staphylococcus albus was present in pure culture in the heart's blood and the bile. The urine was sterile.

These results show as far as they go that no condition at all resembling the human disease was produced in rabbits by subcutaneous, intravenous or oral administration of the organism. Ordway[18] produced in rabbits a typhoid-like disease by subcutaneous inoculation of another member of this group, B. suipestifer. The constant and most characteristic lesions were necrosis of the liver. The intestinal lesions, which were less constant and striking, consisted in swelling of Peyer's patches and endothelial proliferation.

SUMMARY.

An acute very contagious disease, of short incubation period, appearing in three forms: the dysentero-septicemic-pneumonic; the pure dysenteric, and the diarrheal. The conditions found in the virulent fatal cases were a membranous ileocolitis, septicemia and a pneumonia with miliary abscesses and large areas of necrosis. The severer forms of the disease occur in debilitated persons. Immunity is of short duration, and recurrences (usually mild) are frequent.

The causative organism is a member of the paratyphoid-enteritidis group, more closely allied, as shown by agglutination tests, with paratyphoid *B*, B. suipestifer and B. enteritidis than with *A*, but not identical with any of them.

The disease was limited to certain buildings of the West Group of the Boston State Hospital. The epidemic was preceded by mild diarrheas among patients and attendants, then broke out in violence in one ward, and was passed from person to person by contact. The source of the infection was not definitely determined. The close affinity of the organism with certain members of the group (suipestifer and enteritidis) which are associated with animals, suggests the possibility of such an origin. No evidence was obtained connecting the human epidemic with an outbreak of hog cholera which had prevailed in the piggery at the West Group during the previous summer, but the pathological anatomy of the two diseases presents certain features of similarity. The hypothesis is suggested that the infection was introduced by the contamination of food in the West Group refrigerator by rats, the infection appearing first as mild cases of diarrhea, then as an outbreak on a single ward, due probably to gross contamination of the food by a human carrier, the difference in the severity of the disease depending on the physical condition of the persons attacked, and possibly also on the rapid transfer of the virus. The disease has now become endemic and has assumed a mild form.

Prophylatic inoculation will not suppress the disease among feeble patients, although it may have some influence in mitigating its severity. Among strong persons, however, it appears to be of more value, in reducing both the number of cases and the type of the disease. Vaccine treatment during the disease has given good results.

A polymorphonuclear hyperleucocytosis occurs after both the prophylactic and therapeutic administration of vaccine. The leukocytic reaction is more marked in the stronger normal individuals than in the feeble ones who have had the disease and recurrent attacks.

Agglutinin formation in the disease is very moderate. Agglutinins for the organism persist in some cases as long as 14 and 17 months after the original attack, when there has been no recurrence. After prophylactic vaccination low titres have been obtained up to 11 months.

Intradermal tests with concentrated glycerin broth cultures of members of the paratyphoid-enteritidis group have given unreliable and conflicting results. Tests with powdered cultures are to be undertaken.

REFERENCES.

[1] Canavan and Gill: Report of an Epidemic of Paratyphoid Fever at the Boston State Hospital. Boston Medical and Surgical Journal, Vol. clxxi, No. 15, p. 545, 1914.
[2] Bainbridge: Milroy Lectures on Paratyphoid Fever and Meat Poisoning. Lancet, Vol. i, No. 9, p. 705, 1912.
[3] Uhlenhuth and Hübener: Kolle and Wassermann's Handb. Path. Microörg., Chap. xiv, pp. 1004-1168, 1913.
[4] Symposium on Paratyphoid. Proc. Roy. Soc. Med., ix Med. Sect., 1915-16.
[5] Korczyski: Wien. klin. Woch., xxviii, 1251, 1915.
[6] Shiga, Osler and McCrae: Modern Medicine, Vol. i, p. 782.
[7] Gay and Force: Arch. Int. Med., Vol. xiii, p. 471, 1914.
[8] Gay and Claypole: Arch. Int. Med., Vol. xiv, p. 671, 1914.
[9] Kolmer and Berge: Jour. of Immun., Vol. i, No. 4, p. 409, 1916.

[10] Gay and Claypole: Arch. of Int. Med., Vol. xiv, p. 662, Nov., 1914.
[11] McWilliams, Helen I.: Jour. of Immunology, Vol. i, No. 2, April, 1916.
[12] Gay, F. P.: Jour. A. M. A., Vol. lxv, pp. 322, 323, July 24, 1915.
[13] McWilliams, H. I.: Med. Rec., Oct. 16, 1915.
[14] Krumwiede, Pratt and Kohn: Jour. Med. Research, Vol. xxxv, No. 1, p. 55, September, 1916.
[15] See Sobernheim and Seligmann: Zeitschr. f. Immun. Forsch., Bd. 6 and 7.
[16] Job et Ballet: Bull. et Mem. Soc. Med. d. Hôp., 3, s. xxxix, 991, 1915.
[17] Kolle and Wassermann: Handb. d. path. Microörg., Vol. vi, article on Schweinseuche u. Schweinpest.
[18] Ordway: Jour. of Med. Research, Vol. xxviii, p. 49, 1913.

Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

The forty-eighth meeting of the New England Pediatric Society was held in the Boston Medical Library, Friday, March 30, 1917, at 8.15 p.m.

The President, Dr. Maynard Ladd of Boston, in the chair.

The following papers were read:—

1. Studies in Infant Feeding; The Mineral Constituents of Milk,* Henry I. Bowditch, M.D., Boston, Alfred W. Bosworth, Boston.
2. Anemia of the Newborn, Karlton G. Percy, M.D., Boston.
3. Nephritis in Childhood, with Especial Reference to Functional Tests, Lewis W. Hill, M.D., Boston.

Unusually Severe Anemia in the Newborn, with Death.

ABSTRACT.

By Karlton G. Percy, M.D., Boston.

Eighth child, healthy parents, three brothers and sisters dead of the same apparent disease within 12 days of life. Other sisters and brothers well. Normal delivery; normal baby for 3 days. Rapidly increasing anemia, without apparent fever, hemorrhages or signs of sepsis. Seen on eighth day. Hgb., 18%; red blood cells, 2,100,000; white blood cells, 18,000. Smear showed moderate polychromatophilis, poikilocytosis, anisocytosis, stippling and increased platelets. Eighteen nucleated reds to 100 white cells. White cells, showing mono-nuclearcytosis, with a tendency of cells to be of primordial type. Wassermann negative. Parents' Wassermann negative. Transfusion, 50 cc., paternal blood, without apparent benefit, and death within eighteen hours. Autopsy showed only excessively active red and white blood cell-formation in spleen, liver, possibly thymus and lymph glands.

Bone marrow not examined. The general picture of the case simulated a severe secondary anemia of infancy, described by Germans as pseudo leukemia infantum.

DISCUSSION.

Dr. Howard: In going over the literature of the blood recently, I have been much impressed with the lack of definite knowledge as to the normal blood in infancy and children, and the still greater lack of definite knowledge apparent in regard to blood diseases in infancy. The full report of studied cases, such as Dr. Percy's, is extremely valuable and necessary for a better understanding of infant blood.

It is to be regretted that in Dr. Percy's case the bone marrow was not examined, as this is a most important part of the blood picture, and almost essential in determining the classification and diagnosis of this case. The history and blood picture, as given, do not seem to me to place this case definitely in any one of the groups of blood diseases of children. I agree with Dr. Percy that the evidence is against an idiopathic aplastic anemia, neither does the case seem to be one of the group known as secondary aplastic anemias. Secondary aplastic anemia can perhaps not be definitely ruled out in the absence of any information as to whether or not the bone marrow was failing to produce one of the elements of the blood—the red corpuscles. The blood picture, however, showing normoblasts and megaloblasts, plenty of blood platelets, and no reduction in polynuclear cells, is very much against the existence of a depression of the blood-forming activity of the marrow, and strongly suggests that the blood-forming function of the bone marrow is, on the contrary, being worked overtime.

Diagnosing this case as a lymphatic leukemia of any type, seems to me open to criticism, as, first, there is no enlargement of the lymph nodes; second, there is no lymphocytosis; third, there is no record of myelocytes in the blood picture.

From the blood picture presented, without knowledge of the condition of the bone marrow, the weight of evidence is in favor of a destructive process confined to the red blood cells, rather than the picture of a definite disease, such as lymphatic leukemia or aplastic anemia of any type. The history of the case and the blood picture give us but little help in determining the etiology of this destructive process. The most suggestive point is the jaundice, which, in this case, we have evidence, is not an obstructive jaundice, and which, we have reason to believe, may not be a simple jaundice of the newborn. This jaundice, it seems to me, may be regarded, in its relation to the blood picture, in either of two ways: It may be due to a toxin,—the same toxin that produced the jaundice causing the destruction of the red blood cells; the other possibility being that it is a hemolytic jaundice, the jaundice in that case being caused by a toxin, and the jaundice causing secondarily red blood cell destruction and anemia.

Dr. Percy: I may add that I am sorry that there was no bone marrow examination done in this case. It was one of those slips which occasionally happens. Yet the differentiation between this type of secondary anemia or pseudo leukemia infantum, and aplastic anemia is shown not only by the ability of the bone marrow to regenerate, but by the presence of regeneration in the other organs of the body. This case did not show any special evidences of other destruction, but it showed a tremendous anemia without any cause, and yet a very definite attempt at regeneration.

In closing I would like to ask if anybody has any suggestions for future babies in this family. The parents are French Canadians; there are apparently going to be more, and if the next one is going to have the same disease as the three who have already died, I would like suggestions as to its treatment.

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* See Journal, page 248.

The term "pseudo leukemia" is one which is used by the Germans, following Naegeli's nomenclature, for a type of case which shows a symptom-complex with marked anemia, enlarged liver, enlarged spleen and a relatively high white count,—that is, a white count above the normal (10,000 or over), with a tendency for the red cells to be regenerated, to show nucleated reds, to show an increased number of platelets; for the white cells to show a tendency toward an abnormal lymphatic picture, and not one of a true myelogenous leukemia; and the finding of definite hyperhematopoiesis and activity in the bone marrow, in the spleen, the liver, the lymph nodes, and possibly in the thymus. Thus, pseudo leukemia is simply a name for those cases in infants with enlarged spleen and with that blood picture, which has been used and is being used by the Germans. It has no connection with von Jacksh's original paper, because his type of anemia was a symptom-complex due to various diseases,—rickets, tuberculosis and syphilis. This case of mine pathologically falls definitely into Naegeli's type of anemia, without any known etiological factor.

Dr. R. M. Smith (Dr. Hill's paper): We are grateful to Dr. Hill for presenting this subject in such a clear manner. As Dr. Coues has just suggested, there is a good deal of work being done in investigating the bacteriology of the urine. It has been shown that in many infectious diseases the organisms are present in the urine. This raises the question whether the nephritis which complicates often the infectious disease, such as tonsillitis, is due exclusively to the toxin of the bacteria, or whether it is due to the direct action of the bacteria in the kidneys.

The hemorrhagic type of nephritis which Dr. Hill has mentioned is often difficult to differentiate from hemorrhagic pyelitis. I have seen quite a number of cases which on first investigation seemed to be hemorrhagic nephritis, which subsequently proved to be pyelitis, with a good deal of bleeding. The picture of the two conditions is not dissimilar. The large amount of blood is a common characteristic, and the casts, which are few in number, are present in both conditions.

I was interested in what Dr. Hill had to say about renal function tests. I think that all agree that the phenolphthalein test is valuable, primarily as a prognostic sign. Most of Dr. Hill's cases did well and the function test was high, but other investigators have reported low function tests, and in the majority of instances these patients did poorly.

Dr. Percy: In regard to the etiology of nephritis, as to whether it is due to toxins or to hematogenous infection from the bacteria themselves, the work of Rosenow of Chicago is of interest in nephritis of childhood. I believe that many positive blood cultures could be obtained early in nephritis, whereby we could feel sure that a damage to the kidney was of actual bacterial origin. We have recently proven the hematogenous bacterial etiology in pyelitis, and recently I have seen a case of nephritis of moderate severity which ran a mild course, from which we recovered streptococci, both from the blood and from the urine, and I believe further blood culture work will show that the kidney itself is infected directly by blood-borne bacteria.

Dr. Coues: I would like to hear Dr. Hill's views with regard to the question of pyelitis. Does he consider that we can make a hard and fast line in cases of pyelitis and say that the rest of the kidney may not be involved? Should not pyelitis be considered as part of a more general kidney infection?

Dr. Hill (in closing): I think it is sometimes very hard to tell whether one is dealing with a case of pyelitis or one of these cases of hemorrhagic nephritis. It is hard, as Dr. Smith has said, and I am not sure whether some of my cases ought to be put into the pyelitis, instead of the nephritis, class. If we see a good many casts in the urine we call it nephritis, but in some of those cases that I have classified as nephritis there have been about equal parts of pus and blood and a few casts, and we may have been wrong in including those in the nephritis rather than in the pyelitis class.

As to the bacteriology of the urine, I wish that I had been able to make urine cultures on the cases that we have had at the hospital, but intend to do it later if there is a chance.

As to the function tests—I think that Dr. Smith is quite right about the value of the low test, and I attach very little importance, indeed, to a high functional test in a child. With a *high* test one cannot tell that a person has a normal kidney, but with repeated *low* tests one knows that the proper functioning is impaired, and is of some value in the prognosis of the long-drawn-out chronic cases. The functional tests in children are, however, of very little value in the *diagnosis* of nephritis.

Book Reviews.

Progressive Medicine. Vol. XX, No. 1. Edited by Hobart Amory Hare, M.D., assisted by Leighton F. Appleman, M.D. Philadelphia and New York: Lea and Febiger. 1917.

This first issue, for the current year, of a standard medical digest of advances, discoveries and improvements in medical and surgical sciences, consists of reviews of surgery of the head and neck by Dr. Charles H. Frazier, and of the thorax by Dr. George P. Müller, which compose a third of the volume. Another third is occupied by Dr. John Ruhräh's review of infectious diseases, including acute rheumatism, croupous pneumonia and influenza. The remainder is divided between the diseases of children by Dr. Floyd M. Crandall, and rhinology, laryngology and otology, by Dr. George M. Coates. The surgical sections are particularly well illustrated with descriptive figures, of which there is a total of twenty-three. The publication continues its usefulness to those who have the inclination and time to maintain a constant familiarity with the advance of medical science.

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Ernest Gregory, *Manager,*

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A CRITICAL SITUATION.

The Government is raising an immense army of volunteers and conscripts to carry on the war to a successful and, we hope, an early termination. Every army must be supplied with a personnel of medical officers of adequate number and well trained. While provisions have been made to raise the required number of men for the fighting force, it has been left to members of the medical profession of this country to come forward voluntarily, seeking commissions in the Medical Reserve Corps.

Only a few of the total number required have applied for commissions. This means that unless immediate action is taken by the profession voluntarily, the men in the army now being organized will be without sufficient medical care. Such a condition would be more than critical and dangerous for the success of our army and the cause in which we are enlisted. The medical officer plays a most prominent part not only in keeping the army on its feet and physically fit for fighting, but in returning to the ranks a large percentage of those who have been temporarily put out through casualties.

How soon will the medical profession of the United States, as a whole, wake up and realize that doctors must come forward and volunteer their services to the Government? In civil life, when great casualties occur, the doctor readily offers his services and usually is the first on the scene to save human life. How much more important is it, then, that in this critical situation, he should come forward and offer his valuable aid to preserve not only human lives, but the life of the nation itself? Application blanks for commissions in the Medical Reserve Corps are being printed in many medical journals or will be sent by the Surgeon-General's Office, or can be secured from members of the Local Board of Examiners.

MASSACHUSETTS NARCOTIC DRUG LAWS.

In another column of this issue of the Journal we publish in full the text of the latest General Act (Chap. 275) relative to the sale and distribution of narcotic drugs, which went into effect in Massachusetts on June 23, 1917. This act, which is based upon the report (No. 149) to the Legislature of a special commission consisting of Dr. Frank G. Wheatley, Mr. Herman C. Lythgoe, and Mr. Abraham C. Webber, is very far-reaching and very important. Probably few physicians in this Commonwealth are conversant with it, or know of its drastic provisions against the possession or sale of a hypodermic syringe. The careful perusal of this act, therefore, is earnestly commended to members of the profession. Especial attention is directed to the requirement that the age of the patient must be put on each prescription containing a narcotic drug; that no such prescription may be filled after five days from the date of its issue; and that the patient obtaining the medicine must sign his or her name on the face of the prescription.

Probably few physicians also know that there is in existence a further law (Chap. 232) relative to the licensing of private hospitals and the admission therein of certain patients, which admits of sending drug addicts to hospitals without court proceeding and attendant publicity; nor do they realize that no records of such cases can be used as evidence in a court of law, which is a matter of great protection in the event of subsequent suit for divorce or the breaking of a will. The complete text of this act, as approved on May 9, 1917, is as follows:

"Section 1. Chapter two hundred and eighty-five of the General Acts of the year nineteen hundred and sixteen is hereby amended by striking out section six and inserting in place thereof the following:—*Section 6.* The commission may annually license any suitable person to establish or have charge of a hospital or private house for the care and treatment of the insane, epileptic, feeble-minded, and persons addicted to the intemperate use of narcotics or stimulants, and may at any time revoke the license. No such license shall be granted for the care and treatment of insane or epileptic persons unless the said commission is satisfied, after investigation, that the person applying therefor is a duly qualified physician, as provided in section thirty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine, and has had practical experience in the care and treatment of such patients. No such license shall be granted for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants unless the commission is satisfied, after investigation, that the person applying therefor is a physician who is a graduate of a legally chartered medical school or college; that he has been in the actual practice of medicine for the three years next preceding his application for a license, nor unless his standing, character and professional knowledge of inebriety are satisfactory to the commission. Licenses granted hereunder shall expire with the last day of the calendar year in which they are issued, but may be renewed. The commission shall have power to fix reasonable fees for said licenses and renewals thereof.

Section 2. Said chapter two hundred and eighty-five is hereby further amended by striking out section seven and inserting in place thereof the following:—*Section 7.* Whoever keeps or maintains a hospital or private house for the care or treatment of the insane, epileptic, feeble-minded or persons addicted to the intemperate use of narcotics or stimulants, unless the same is in charge of and under the direct personal supervision of, a person duly licensed under this act, shall be guilty of a misdemeanor, and shall be punished by a fine of not more than five hundred dollars.

Section 3. The superintendent or manager of any hospital or private house licensed for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants may, when requested by a physician, by a member of the board of health or a police officer of a city or town, by an agent of the institutions registration department of the city of Boston, by a member of the district police, or by the wife, husband, guardian or, in the case of an unmarried person having no guardian, by the next of kin, receive and care for in such hospital, as a patient for a period not exceeding fifteen days, any person who needs immediate care and treatment because he has become so addicted to the intemperate use of narcotics or stimulants that he has lost the power of self-control. Such request for the admission of a patient shall be made in writing and filed at the hospital at the time of his reception, or within twenty-four hours thereafter, together with a statement, in a form prescribed by the commission, giving such information as the commission may deem appropriate. The trustees, superintendent or manager of such hospitals or private houses shall cause to be kept a record, in such form as the commission may require, of each case treated therein, which shall at all times be open to the inspection of the commission and its agents. Such records shall not be a public record, nor shall the same be received as evidence in any legal proceeding. The superintendent or manager of such a hospital shall not detain any person received as above for more than fifteen days, unless, before the expiration of that period, such person shall have been committed or has signed a request to remain."

All physicians practising in this Commonwealth are again earnestly urged carefully to read these two acts in order that they may be intelligently familiar with the latest and present provisions of the Massachusetts Narcotic Drug Laws.

MEDICAL NOTES.

Death Rates In London.—Statistics recently published show that in May the total death rate of London was only 13.9, and in June, 12 per thousand inhabitants living. Among the several districts and boroughs in May, the highest rate was 17.2 in Holborn, a crowded central slum, and the lowest was 9.1 in Hampstead, an open district on the north. In June the highest rate was 18.1 in Holborn, and the lowest was 8.7 in Lewisham, an open district on the south.

Medical Students In Switzerland.—A recent report shows that the total number of medical students in the five Swiss universities during the winter semester of 1916-1917, was 1901. These were distributed as follows:

Bâle had 215, among whom were 12 women; there were 47 foreign students, of whom 2 were women. Berne had 411, among whom were 45 women; there were 168 foreigners, of whom 29 were women. Geneva had 512, of whom 110 were women; there were 333 foreigners, of whom 90 were women. Lausanne had 248, of whom 35 were women; there were 97 foreigners, of whom 23 were women. Zürich had 515, of whom 89 were women; there were 182 foreigners, of whom 42 were women.

Prevalence of Disease in the United States.—The weekly report of the United States Public Health Service for July 27, 1917, states that during the month of June there were fifty-eight cases of cerebrospinal meningitis in Ohio, 213 of malaria and 79 of pellagra in Lousiana, 229 cases of smallpox in Kansas, 279 in Minnesota and 419 in Ohio. There were 242 cases of typhoid fever in Louisiana. The same bulletin contains a report on malaria in Louisiana, particularly with reference to its prevalence and geographic distribution.

WAR NOTES.

Red Cross Appropriation.—It is reported that the Amercian Red Cross has appropriated $800,000 to meet sanitary emergencies in the civilian areas surrounding army cantonments. A bureau under the direction of Dr. W. H. Frost, of the Public Health Service, will have charge of the work. The Red Cross will undertake such sanitary management only by request of the local organization in charge.

Medical Reserve Corps.—Dr. David D. Scannell of Boston has been ordered to report to Fort Benjamin Harrison, Indianapolis, and left this city on August 7, for service with the Medical Reserve Corps.

Tuberculosis Among Soldiers.—Dr. John B. Hawes of Boston, secretary to the trustees of the Massachusetts Hospital for Consumptives, is author of the following circular, entitled "Facts for Fighters," which has been sent out by the Massachusetts Anti-Tuberculosis League, to all soldiers and recruits in this Commonwealth.

"Consumption can be contracted by those who are weak, run down, or in any way in poor condition.

In private life any person may take chances with his health, if he cares to do such a foolish thing, without, necessarily, hurting others or the community at large. In time of war this is different. The soldier owes it to his country to maintain his bodily efficiency at the very highest possible point. This is the best way to avoid consumption.

When a soldier is on duty, the details of his life are regulated in every way. When he is off duty he can do himself physical harm or good. Therefore he should spend this time as profitably as possible by increasing his bodily strength and energy and not wasting it. This is an important way of preventing consumption.

Excesses of all kinds weaken a man and render him liable to infection, especially to infection with consumption.

Remember that the germs of consumption and other contagious diseases are spread by spit. Therefore never spit in closely crowded quarters, barracks, tents, etc.

Danger Signals. If you develop a cough, with or without spit, which hangs on for some time; if you raise any blood; if you are losing weight and strength, don't wait but go at once to the proper person and place these facts before him.

If you know that you have consumption, even though you have passed the physical examination, don't conceal it. The chances are that you will break down later on. You will do your country no good, but, on the contrary, you will do it great harm if you conceal this fact.

Remember that one of the greatest things you, as a soldier, can offer to your country is good health."

American Women's Hospitals.—The War Service Committee of the Medical Women's National Association has organized the American Women's hospitals for work at home and abroad. The Surgeon-General of the Army, and the General-Director of the Department of Military Relief of the American Red Cross have approved the provision made for service to the army and to the civil population. The work will be officially part of the medical and surgical service of the American Red Cross.

The scope of the plan is broad. It includes units for maternity service and village practice in the devastated parts of the Allies' countries and hospitals run by women for service there as well as for the United States army in Europe. In this country acute and convalescent cases will be treated in hospitals equipped for the purpose; soldiers' dependents will be cared for, interned alien enemies will be given medical aid and substitutes will be provided to look after the hospital service and the private practice of physicians who have gone to the front. The first units hope to go to France and to Serbia in the early fall. Headquarters have been established at 637 Madison Ave., New York City. Dr. Rosalie Slaughter Morton is Chairman of the War Service Committee.

Diphtheria in Newport.—On August 9 the number of new cases of diphtheria reported in Newport, R. I., was fifteen, the lowest since the outbreak of the disease. This made the total number of cases 267. The health officials, in an effort to check the epidemic, have prohibited the sale of ice cream and have refused to allow the shipment of milk or the departure of any person from nine dairy farms in Portsmouth. With but one exception those affected have a light form of the disease. At Fort Adams there are eight cases among the Naval Reserves. A strict quarantine is maintained. Drs. George W. McCoy and Joseph Bolton of the United States Public Health Service have arrived to aid in checking the epidemic.

Physical Condition of Drafted Army.—The Bulletin of the Department of Health, New York City, makes the following comment on the physical condition of men who are examined for drafting into the army.

"According to press reports concerning the results of the physical examination of men drafted for military service, the proportion of men found physically fit is surprisingly small. This is discouraging, for, while the army standards undoubtedly demand a good physique, they do not, by any means, seek perfection. It is, of course, possible that the results of these first examinations are not fairly representative, and that the proportion of those who meet the requirements will eventually reach a satisfactory average. The results thus far, however, would seem to indicate that we are dealing here with the fruits of individual and community neglect; many of the defects disclosed at these examinations could undoubtedly have been prevented by suitable attention in early life.

It is significant that the individuals examined represent a class which did not have the benefit of the corrective influence exercised by school medical inspection. Certain it is that the health and physical condition of the coming generation has been much more carefully safeguarded. Each year nearly a third of a million school children in the city of New York are medically examined by physicians of the Department of Health. In one-third of the children various forms of physical defects are found, most of them remediable. It is by insistent follow-up of these cases by the Department's school nurses that a very large proportion of these defects are corrected. That this form of supervision is productive of good results and will, in time, result in a higher average of physical well-being in the adult population of this city, is indicated by the fact that the physical examination of pupils in the upper grades in school, or of high school pupils, regularly, shows a lower proportion of physical defects than that found in the examination of pupils of the lower grades.

The lesson taught by the results of the draft examinations is plain. We must strive in every way possible to discover and correct physical defects early in life. But this is not all. By insistence on proper living conditions, *i.e.*, good homes, good food, sanitary shop conditions, decent wages and wholesome rest and recreation, we should make sure that physical health will be maintained."

Irish Medical Profession in the War.—The *British Medical Journal* has recently published the following sketch descriptive of the contribution of service made by the Irish medical profession in the war.

"Since the outbreak of the war the Irish medical profession has voluntarily supplied a large proportion of its members for the medical services of the army and navy. The proportion of Irish doctors who have joined the medical services is much higher than would appear from a casual glance of the number of doctors who are registered with Irish addresses. Whilst over 3000 doctors are usually registered with Irish addresses, it is very doubtful whether, even in times of peace, the number engaged in all classes of Irish medical practice ever reached 2000. It is generally estimated that only one in six newly qualified Irish doctors commences practice in Ireland. The great majority go to England and Wales and a smaller number go to the colonies.

Owing to the number of doctors who have accepted temporary commissions in the R.A.M.C., there are many rural districts in Ireland depending upon one doctor to look after the health of 6000 or 8000 of the population, and it is believed that even if military service were made compulsory on the profession in Ireland, the number of doctors joining the medical services could not be very much increased beyond that now obtained voluntarily.

The members of the Irish profession who have remained at home because they are over military age, or for other reasons, have given very valuable help in treating wounded soldiers in the general hospitals, or in V.A.D. hospitals, specially organized for the reception and treatment of wounded soldiers. The War Office accepted last April a long-standing offer from the medical profession in Dublin to staff a base hospital for France. The doctors who will form the staff of this hospital will work in relays of nine for a term of three months, and will consist of three surgeons, two physicians, an ophthalmologist, a pathologist, a radiographer, and an anesthetist. Similar offers have been made by the profession in Belfast and Cork, but, so far, they have not been accepted by the War Office.

The Irish Medical War Committee was formed at a meeting of the profession convened by the Leinster Branch of the British Medical Association in May, 1915. It consists of two representatives of each of the various licensing bodies and medical schools in Ireland. Among its chief duties are: (1) to provide doctors for the army and navy, (2) to protect the interests, during their absence, of those doctors who join the medical services and to assist them in finding suitable substitutes, (3) to advise regarding the medical requirements of the civil population. Public bodies, such as boards of guardians, have, with very few exceptions, given facilities to their medical officers who desired to apply for commissions in the medical services. They have not only given them the necessary leave, but in most cases have agreed to pay half their salaries during their absence as well as to pay the full salaries of their locumtenents. It is, however, to be regretted that some boards of guardians have persisted, contrary to the advice of the Irish Medical War Committee and the ruling of the Local Government Board, in appointing, as locumtenents, doctors of military age, when it was open to them to appoint doctors who were not available for military service.

An American Medical Prisoner.—Report from New York on July 13 describes the adventures of Dr. A. M. Mars of San Francisco, who for nearly three years, it is said, was held prisoner in a German detention camp at Luxemburg, despite his protests that he was an American citizen, though born in Paris. Dr. Mars is reported as saying that he was well treated by the Germans, and was put in sanitary charge of the camp, where about three thousand French and English prisoners were detained. Dr. Mars finally escaped to Holland, whence he sailed to New York on a Spanish steamship.

Arrival of Tuberculosis Commission.—The Tuberculosis Commission, under the leadership of Dr. Livingston Farrand, sent to France by the Rockefeller Foundation, has arrived in Paris, and is in coöperation with the Red Cross representative, Homer Folks.

Appointments of Veterinary Surgeons.—Surgeon-General Gorgas of the United States Army has appointed an advisory board to reorganize the Veterinary Corps of the Army. It is comprised of the following men: Dr. C. J. Marshall, Pennsylvania; Dr. David S. White, dean of the College of Veterinary Medicine, Ohio State University, Columbus, O.; Dr. Louis A. Klein, dean of the School of Veterinary Medicine, University of Pennsylvania; Dr. V. A. Moore, dean of the New York State Veterinary College, Cornell University, Ithaca, N. Y.; and Dr. John R. Mohler, assistant chief of the Bureau of Animal Industry, Washington, D. C.

Red Cross in Merger with Surgical Dressings Committee.—The National Surgical Dressings Committee, which includes 25,000 members throughout the country, has merged its organization with the Red Cross and will henceforth work under that leadership. The committee will retain all its officials, and will continue its work as heretofore. More than 16,000,000 dressings have been sent to Europe through its branches since the war began. This is the first relief organization to merge with the Red Cross.

Hospital Units for Nervous and Mental Disorders.—Dr. Pearce Bailey of New York, chairman of the Committee on Furnishing Hospital Units for Nervous and Mental Disorders to the United States Government, a sub-committee of the National Committee for Mental Hygiene, has been invited by the Surgeon-General of the United States Army to accept a commission as major and to come to Washington as personal advisor to the Surgeon-General in all matters pertaining to psychiatry and neurology. Major Bailey is now on duty in the Surgeon-General's office. Dr. Frankwood E. Williams, associate medical director of the National Committee for Mental Hygiene, has been appointed vice-chairman of the committee and placed in charge of the work in the New York office.

American Hospitals in Army Zone.—Two of the Red Cross Base hospitals first to arrive in the American army zone in France have been taken over by the United States Government. The first on the field was Base Hospital No. 18, organized at Johns Hopkins University, and the second, No. 15, was recruited from the Roosevelt Hospital, New York. The units are occupying French hospitals vacated for their use, and capable of accommodating from 1000 to 1500 patients. Large amounts of supplies were taken across by the units, but because of the scarcity of coal in France, the problem of heating the hospitals when cold weather approaches, will be a serious one. With such secrecy was the movement of the Roosevelt Hospital unit carried on from the time of its disembarkment at port to its establishment in hospital, that the headquarters of the press association, but a short distance away, was unaware of its existence for some days.

Volunteer Physicians for Examining Soldiers.—To accomplish the task of examining men to be drafted into the United States Army, in New York, many prominent physicians have volunteered their services. A large number of physicians will be called upon to make examinations in order that no unnecessary delay may arise.

Assignments of New England Doctors.—The following assignments of New England doctors have been made to conduct physical examinations under the new draft bill.

Lieut. George L. Pratt, Lieut. Merton H. Langwill, Maine Medical Corps, to Cambridge, to assist in physical examination of the 8th Massachusetts Infantry.

Maj. H. R. Stiles, U. S. A., retired, at Hartford; Lieut. Thomas F. Healey, New Haven, to make physical examination of National Guard of Connecticut at Niantic.

Capt. L. O. Tarleton, Massachusetts Medical Corps, Boston; Lieut. Herbert W. Taylor, Vermont Medical Corps; Maj. Charles C. Smith, Boston, to South Armory, Boston, to make physical examinations.

Capt. H. W. Stevenson, Medical Reserve Corps, Saco, Me.; Lieut. Arthur P. Perry, Boston, to Concord, N. H., for physical examination of National Guard.

Capt. A. E. Austin, Medical Reserve Corps, Boston; Lieut. Ray E. Smith, Vermont Medical Corps, to Charlestown Armory for physical examination of 5th Massachusetts Infantry.

Capt. Harry G. Martin, Massachusetts Medical Corps; Lieut. Frank Piper, Rhode Island Medical Corps, to Quonset Point, R. I., for physical examination.

Capt. Mason D. Bryant and Lieut. Arthur M. Curran, Massachusetts Medical Corps; Lieut. George H. Kirkpatrick of Framingham, to Boxford, for physical examination of National Guard there.

Capt. James Glass, Ayer, and Lieut. Clyde C. Johnson, New London, Conn., for physical examination of Coast Artillery Corps of Connecticut.

Lieut. William R. Dwyer and Lieut. James A. Lyon, Framingham, to Allston to assist in physical examinations.

Sergts. Region V. Love and Harry W. White, C. A. C., to Boxford for clerical work, in connection with muster of troops. Sergt. Steven E. Smith for clerical work at 1st Corps Cadets Armory; Sergt. Clarence G. Meyer to Commonwealth Armory, Allston, for clerical work.

Appointments on Medical Staff of State.—The State Guard of Massachusetts, consisting of 135 companies, numbering about 9000 men, has on its medical staff the following men: Medical staff—Lieut.-Col. William A. Brooks; surgeons, Capt. Donald V. Baker, Capt. William A. Brown, Capt. Harold G. Giddings, Capt. George W. Morse, Capt. Russell F. Sheldon, Capt. Benjamin E. Sibley, Capt. Edward A. Supple; physicians, Capt. John W. Dewis, Capt. Thomas F. Harrington; nose and throat surgeons, Capt. George L. Tobey, Capt. D. Harold Walker; dental surgeon, Capt. Kurt H. Thoma; roentgenologist, Capt. Ralph G. Leonard; ophthalmic surgeons, Capt. Ralph G. Loring, Capt. P. Somers Smyth; orthopedic surgeon, Capt. W. Russell MacAusland; surgeons throughout the state, Capt. Hardy Phippen of Salem, Capt. Charles E. Durant of Haverhill, Capt. Thomas B. Smith of Lowell, Capt. Ralph H. Seelye of Springfield, Capt. Lemuel F. Woodward of Worcester, Capt. P. Truesdale of Fall River, Capt. Garry DeN. Hough of New Bedford, Capt. Franklin H. Thompson of Fitchburg.

College Ambulance Corps.—There are nearly 5000 college men in the military camp at Allentown, Pa., training for work in ambulance corps abroad.

Condition of Men in Pershing's Army.—Report from the American Training Camp in France states that the health of the troops is of the best. What little sickness there is is limited almost entirely to measles and mumps contracted in the United States. Every soldier has been vaccinated against smallpox and inoculated against typhoid. Each troop section has a supply of hypochloride of calcium for purifying the water used. An adjacent French base hospital has been taken over by the American army and will be equipped with a staff of physicians from Johns Hopkins Medical School. The capacity of the hospital is for one thousand beds. Each troop section has a local dispensary with twelve beds and a field hospital.

Health Measures for Ayer Camp Ground.—The monthly Bulletin of the State Department of Health for June gives an account of the preparations made for adequate sanitary care of the military camp in Northern Massachusetts:

"The towns in which the camp is located, together with those adjoining, are Ayer, Littleton, Harvard, Lancaster, Shirley, Townsend, Groton and Pepperell, having a population, according to the 1910 census, of from 1034 to 2955, aggregating 16,534. During the next five years they gained in population but 397. These towns are as well organized for the preservation of health as the average Massachusetts town of their size. They have the usual sanitary conditions, consisting of little else than a good water supply, Harvard and Townsend being the only ones without a public supply for their thickly settled districts. None have a public sewer system, consequently most of them at times have cesspool, drainage and privy nuisances. But few have efficient milk inspectors. All have inspectors of slaughtering, but no inspectors of provisions. All have medical inspection of schools, but not of an intensive character. Ayer, Lancaster and Pepperell already have public health or district nurses, including school nursing, while Groton and Shirley have plans nearly perfected for employing similar workers.

Realizing that it would be an injustice to tax the towns for more than would be required for a first-class health organization in ordinary times, the Commissioner of Health addressed the following communication to his Excellency the Governor of the Commonwealth of Massachusetts:—

May 21, 1917.

'*To His Excellency, Hon. Samuel W. McCall,*
Governor of the Commonwealth of Massachusetts, State House, Boston, Mass.

Sir:—I have the honor to invite attention to the very serious sanitary problem which presents itself in connection with the proposed military camp at Ayer. It is proposed to place 30,000 men for training in this camp. There will be, undoubtedly, a surplus population of 8,000 or 10,000 civilians suddenly added to the population of Ayer and the surrounding towns. Camp followers, unlicensed venders of food and drink, prostitutes and other persons disposed to disregard law and ordinances will drift into this area.

Within a radius of 10 miles from Ayer as a center there are 15 towns with populations ranging from 800 to 3,000. Manifestly, these towns are unable to finance a proper health organization, and it would be unfair to expect that of them. Experience in England and France has proved that to avoid disaster the complete sanitary organization should be in the field working long before the recruits begin training. The Federal government, under existing law, is restricting its sanitary work to the care of the soldier and his camp. A bill for a Federal sanitary reserve corps, which would take care of the surroundings of camps and the civilian population contiguous thereto, is in Congress now, and has the unanimous support of the National Council of Defense. This may or may not go through, but even if it does it will operate too late to meet the emergency which we now face in Massachusetts.

To avoid disastrous conditions prompt action is necessary, and the sanitary organization should be placed in the field with the minimum of delay. There is no money available for such an extraordinary purpose in addition to the ordinary duties of the State Health Department. The work would require the full time of one District Health Officer, one assistant sanitary engineer, two sanitary inspectors, one food and drug inspector, three public health visiting nurses, and the staff and expenses of a small contagious disease hospital. A careful estimate of the cost of such an organization has been made, and $20,000 will be necessary for the period of one year.

In view of the fact that in the last analysis this is a Federal matter, an emergency obligation placed upon Massachusetts by Federal action, it seems reasonable that the Federal government would later take over the financing of such work and reimburse States for expenditures made. It would be a fatal blunder, however, to wait for Federal action to meet this menace and cover this emergency.

I have the honor, therefore, to recommend that the sum of $20,000, or such part thereof as may be necessary, be appropriated to be expended under the direction of the Commissioner of Health for the purpose of protecting the health of the people of Massachusetts and establishing and maintaining sanitary conditions in the area within a 15-mile radius of Ayer.

Respectfully,
A. J. McLaughlin,
Commissioner of Health.' "

Upon receiving the communication the Governor submitted to the Legislature a message incorporating the recommendation of Dr. McLaughlin and asking for an appropriation of $20,000 to furnish means of a complete sanitary organization and of $10,000 to establish a supplementary police force to cope with moral evils engendered by the presence of a military camp and to secure due enforcement of existing law.

In response to this message, the following special act was passed by the Legislature.

"The State Department of Health was asked by the town officials to direct the public health work in the various towns. The Commissioner appointed the following committee to represent the Department in the field: Dr. Charles E. Simpson of Lowell, chairman, Dr. William W. Walcott of Natick, and Dr. Francis A. Finnegan of Fitchburg, recorder.

An organization has been formed comprising an executive member of the board of health of the various towns as a community health council to act in conjunction with, and under the discretion of the State District Health Officers. In this way a uniformity of rules and regulations and in the manner of their enforcement throughout these towns will be secured. A similar organization of selectmen and school boards is under way, and it is hoped to interest the various public safety committees along similar lines.

It is proposed to establish in Ayer headquarters for the State officers who are to help in carrying out this work, and to furnish an inspector of milk, food and provisions from the State Health Department. A sanitary inspector or inspectors will also be provided, and a supervising nurse and other nurses, if necessary. Some provision is under consideration for an isolation hospital."

Homeopathic Base Hospital.—The American Institute of Homeopathy has offered to the Government, through the Red Cross, three base hospitals with one thousand trained men, equipped for war purposes. These base hospitals would be connected respectively with the Metropolitan and the Hahnemann Hospitals of New York and the Hahnemann Hospital of Chicago.

War Relief Funds.—On Aug. 17, the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$246,648.87
Armenian Fund............	215,240.13
Permanent Blind Fund......	121,732.73
Surgical Dressings Fund.....	116,961.01
Polish Fund..................	77,415.95
Italian Fund..................	44,114.72
War Dogs' Fund..............	1,003.75

BOSTON AND MASSACHUSETTS.

Week's Death Rate In Boston.—During the week ending Aug. 11, 1917, the number of deaths reported was 205, against 220 last year, with a rate of 13.86 against 1509 last year. There were 42 deaths under one year of age, against 49 last year.

The number of cases of principal reportable diseases were: Diphtheria, 49; scarlet fever, 7;

measles, 40; whooping cough, 33; typhoid fever, 3; tuberculosis, 69. Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 1; whooping cough, 1; tuberculosis, 3.

Total deaths from these diseases were: Diphtheria, 4; measles, 4; whooping cough, 1; typhoid fever, 2; tuberculosis, 17. Included in the above were the following non-residents: Diphtheria, 2; tuberculosis, 2.

DEDICATION OF IPSWICH HOSPITAL.—The new building of the Benjamin Stickney Cable Hospital at Ipswich, Mass., was dedicated on August 4, with appropriate exercises. This hospital is the gift of Richard T. Crane, Jr., and Mrs. Crane to the town of Ipswich. It has an endowment of $30,000. It accommodates twenty-four patients, and to those who cannot pay its services are free. Mrs. Helen S. Chapman, a graduate of the Massachusetts General Hospital Training School, is superintendent, and local doctors will be on the active staff. The trustees have offered the hospital to the government as a base hospital if need arises, and the building then can be made to accommodate one hundred and fifty beds. Herbert Warren Mason is president of the board of trustees, Rev. T. Franklin Waters, secretary, and Howard N. Doughty, treasurer. Physicians on the active staff are: Dr. G. G. Bailey, Dr. Frank L. Collins, Dr. George E. MacArthur and Dr. M. C. McGinley. On the general consulting staff the following have agreed to serve: surgical, Dr. J. Dellinger Barney, Dr. Fred B. Lund, Dr. Charles G. Mixter, Dr. William J. Mixter, Dr. Samuel J. Mixter; medical, Dr. Charles W. Townsend, Dr. William B. Robbins, Dr. William E. Tucker, Dr. H. F. Vickery; children, Dr. Richard M. Smith, Dr. Maynard Ladd; ear and throat, Dr. Eugene A. Crockett, Dr. George H. Powers, Jr.; nose and throat, Dr. J. L. Goodale; neurologist, Dr. E. W. Taylor; skin, Dr. E. L. Oliver; obstetrics, Dr. Howard T. Swain, Dr. James L. Huntington; oculist, Dr. Alex Quackenboss; orthopedic, Dr. Robert B. Osgood, Dr. Lloyd T. Brown; dental staff, Dr. F. W. Keyes, Dr. E. J. Smith, Dr. F. A. Stockwell.

The hospital is given in memory of Benjamin Stickney Cable, a friend of Mr. Crane, who was fatally injured in an automobile accident near Ipswich a few years ago.

INFANTILE PARALYSIS IN MASSACHUSETTS.—There have been ten cases of infantile paralysis reported to the State Department of Health for the month of July. At a corresponding date last year twenty-nine cases had been reported. The cases reported for the first sixteen days of the month are as follows: Haverhill, 4; Lowell, 2; and Medford, Beverly, Springfield and Malden, each 1.

TUBERCULOSIS CONFERENCE AT FRAMINGHAM.—The Framingham Health and Tuberculosis Demonstration held, on July 23, at Framingham, a quarterly meeting of its national committee. There were present Dr. Charles L. Miner of Asheville, N. C., president of the National Tuberculosis Association, Dr. Charles J. Hatfield of Philadelphia, Dr. Leo K. Frankel of New York, and Dr. Eugene H. Kelley and Dr. Arthur K. Stone of Boston. The committee plans to hold meetings at least semi-annually in Framingham during the three-year period of the health demonstration. Other meetings are ordinarily held in New York. Special satisfaction was expressed at the amicable and helpful relations existing between the Health Station and local authorities.

BROCKTON HOSPITAL.—Report of Brockton Hospital, Brockton, Mass., for the year 1916 shows a substantial increase in the number of patients treated. There were 1244 patients admitted to the wards, an increase of 7%, and 690 out-patients treated, or an increase of 56%. The orthopedic service increased in number of patients by 25%, and the obstetric service by 70%. The per capita cost remains unchanged, at $13.95 per week. Of the 1503 weeks of treatment furnished, 723 patients paid in full, 112 patients paid in part, and 456 patients paid nothing. It is desired that a new ward building be added to the hospital, in order to cope with its increasing demand for service.

FAULKNER HOSPITAL.—The Faulkner Hospital of Jamaica Plain, Mass., held, on August 8, the graduating exercises of the nurses' training school and celebrated the opening of the new maternity building. Seven nurses received their diplomas.

BOSTON SCHOOL OF PHYSICAL EDUCATION.—The fourth annual catalogue of the Boston School of Physical Education calls attention to the new building soon to be occupied by the school, on South Huntington Avenue, Boston. This institution, established as is stated "to provide for women a course in physical education which should fit them to meet as teachers the increasing need for instruction in the proper use of the body and its relation to human efficiency," offers a course of study covering two years of thirty-two weeks each. Carefully directed training is given in posture, gymnastics, games, dancing and swimming. With this is correlated systematic instruction in such allied academic subjects as anatomy, physiology, hygiene, and the principles of education.

POLIOMYELITIS IN BROCKTON, MASS.—The appearance of three cases of poliomyelitis in Brockton, Mass., in two weeks, while causing some local anxiety, shows how little the occurrence of another epidemic is to be feared this present season.

The Massachusetts Medical Society.

AN ACT RELATIVE TO THE SALE AND DISTRIBUTION OF CERTAIN NARCOTIC DRUGS.

Be it enacted, etc., as follows:

SECTION 1. Except as otherwise provided in sections two and three hereof it shall be unlawful for any person, firm or corporation to sell, furnish, give away or deliver coca leaves or any cocaine or any alpha or beta eucaine or any synthetic substitute therefor, or any salts, compound or derivative thereof, except decocainized coca leaves and preparations thereof, or any opium, morphine, heroin, codeine or any preparation thereof, or any salt, compound or derivative of the same, except upon the written order of a manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business, as such, physician, dentist, veterinarian, registered under the laws of the state in which he resides, or an incorporated hospital, college or scientific institution through its superintendent or official in immediate charge, or upon the written prescription of a physician, dentist or veterinarian, registered under the laws of the state in which he resides, bearing his legal signature, the date of the signature, his office address, the registry number given him under public acts two hundred and twenty-three of the sixty-third congress, approved December seventeenth, nineteen hundred and fourteen, and the name, age and address of the patient for whom it is prescribed. The prescription, when filled, shall show the date of filling and the legal signature of the person filling it written across the face of the prescription, together with the legal signature of the person receiving any such drug, and the prescription shall be retained on file by the druggist filling it for a period of at least two years. No prescription shall be filled except in the manner indicated therein, and at the time when it is received, and the full quantity of each substance prescribed shall be given. No order or prescription shall be received for filling or filled more than five days after its date of issue as indicated thereon. Any pharmacist who fills a prescription for a narcotic drug shall securely attach to the container thereof a label giving the name and address of the store in which the prescription is filled, the date of filling, the name of the person for whom it is prescribed, the name of the physician, dentist, or veterinarian who issued it; and the narcotic drug so delivered shall always be kept in its container until actually used. The prescription shall not again be filled, nor shall a copy of the same be made, except for the purpose of record by the druggist filling the same, and it shall at all times be open to inspection by the officers of the state department of health, the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said departments and boards, and by the police authorities and police officers of cities and towns: *provided, however*, that the provisions of this act shall not apply to prescriptions, nor to the sale, distribution, giving away or dispensing or possession, of preparations or remedies, if such prescriptions, preparations and remedies do not contain more than two grains of opium or more than one quarter of a grain of morphine, or more than one eighth of a grain of heroin or more than one grain of codeine, or any salt, compound or derivative of any of them in one fluid ounce, or, if a solid or semi-solid preparation, in the avoirdupois ounce; nor to liniments, ointments or other preparations which are prepared for external use only, except liniments, ointments and other preparations which contain cocaine or any of its salts or alpha or beta eucaine or any of their salts or derivatives, or any synthetic substitute for them; *provided*, that such preparations, remedies or prescriptions are sold, distributed, given away or dispensed or held in possession in good faith as medicines and not for the purpose of evading the provisions of this act, and *provided, further*, that the possession of any of the drugs mentioned in this act, except prescriptions and preparations or remedies especially exempted in this section, by any one not being a manufacturer or jobber of drugs, or wholesale druggist, registered pharmacist, actively engaged in business as such, or a physician, dentist or veterinarian, registered under the laws of the state in which he resides, or superintendent or official in charge of an incorporated hospital, college or scientific institution shall, except as provided in section eight, be presumptive evidence of an intent to violate the provisions of this act. The provisions of this section shall not apply to persons having in their possession any of the above mentioned articles by virtue of a legal prescription legally issued as provided in this act, and not obtained by any false representation made to the physician, dentist or veterinarian issuing it, or to the pharmacist who filled it, nor shall the provisions of this act apply to decocainized coca leaves or preparations made therefrom or to other preparations of coca leaves which do not contain cocaine.

SECTION 2. It shall be unlawful for any practitioner of veterinary medicine or surgery to prescribe any of the drugs mentioned in section one of this act for the use of, or in such manner that it may be used subcutaneously by a human being, and it shall be unlawful for any physician or dentist to prescribe, dispense, administer, sell, give away, or deliver, any narcotic drug to any person except when the drug is obviously and in good faith then and there needed for the treatment and cure of a disease or ailment, and not for any condition or disease directly due to any drug habit or resulting solely from the failure of an habitual user of narcotic drugs to procure the particular narcotic drug or drugs to which he is addicted.

SECTION 3. It shall not be unlawful for a physician personally to administer any narcotic drug at such time and under such circumstances as he, in good faith and in the legitimate practice of medicine, believes to be necessary for the alleviation of pain and suffering or for the treatment or alleviation of disease.

SECTION 4. Any manufacturer or jobber of drugs, any wholesale druggist, any registered pharmacist actively engaged in business as such, and any physician, dentist or veterinarian registered under the laws of the state in which he resides may sell coca leaves, cocaine or any alpha or beta eucaine or any synthetic substitute for them or any preparation containing the same, or any salts, compound or derivative thereof, or any opium, morphine, codeine, heroin or any preparation thereof, or any salt or compound or derivative of such substances, to any manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business as such, or physician, dentist or veterinarian registered under the laws of the state in which he resides, or to any incorporated hospital, college or scientific institution, but such substances or preparations, excepting such preparations as are included within the exemptions set forth in section one, shall be sold only upon the written order of an incorporated hospital, college or scientific institution, duly signed by its superintendent or official in immediate charge, or upon a written order duly signed by such manufacturer or jobber in drugs, wholesale druggist, registered pharmacist actively engaged in business as such, or physician, dentist or veterinarian registered under the laws of the state in which he resides, and the order shall state the article or articles ordered, the quantity ordered and the date. The said orders shall be kept on file in the laboratory, warehouse, pharmacy or store in which they are filled by the proprietor thereof or his successors for a period of not less than two years after the date of delivery, and shall be at all times open to inspection by the state department of health, the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns.

Section 5. Any manufacturer or jobber in drugs and any wholesale druggist, any registered pharmacist actively engaged in business as such, any physician, dentist or veterinarian registered under the laws of the state in which he resides, and any incorporated hospital, college or scientific institution through its superintendent or official in immediate charge that shall give an order for any of the aforesaid drugs in accordance herewith shall preserve a duplicate thereof for a period of two years after the date of giving the same, which shall at all times be open to inspection by the state department of health, members of the board of registration in pharmacy, the board of registration in medicine and the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns. The order now or hereafter required by the regulations of the commissioner of internal revenue under and by virtue of said public act number two hundred and twenty-three of the sixty-third congress, shall be deemed to be a sufficient order to comply with this and the preceding section.

Section 6. Any person who, for the purpose of evading or assisting in the evasion of any provision of this act shall falsely represent that he is a physician, dentist or veterinarian, or that he is a manufacturer or jobber in drugs or wholesale druggist or pharmacist actively engaged in business as such, or that he is superintendent or official in immediate charge of an incorporated hospital, college or scientific institution, or a person registered under said public act two hundred and twenty-three of the sixty-third congress, or who, not being an authorized physician, dentist or veterinarian, makes or alters a prescription or written order for any of the narcotic drugs above mentioned, or knowingly issues or utters a prescription or written order falsely made or altered, or whoever makes any false representation or statement as to his name, age, address, or any other matter, either in writing or orally, to any physician, dentist, pharmacist, or veterinarian for the purpose of procuring a prescription for, or the delivery of, a narcotic drug, shall be deemed guilty of a violation of this act. A prescription or order that is altered, or is obtained by a false representation shall be void and of no effect.

Section 7. The possession of a federal certificate issued under and by virtue of said public act number two hundred and twenty-three of the sixty-third congress, by any person shall be prima facie evidence of an intent to sell, furnish, give away or deliver any of the drugs mentioned in this act.

Section 8. Nothing in this act shall apply to common carriers engaged in transporting the aforesaid drugs or to any employee, acting within the scope of his employment, of any person who shall lawfully be in possession, for the purpose of delivery, of any of the drugs mentioned in this act, or to any person who shall deliver any such drug, which has been prescribed or dispensed by a physician, dentist or veterinarian registered under the laws of the state in which he resides, who has been employed to prescribe for the particular patient receiving such drug, or to a nurse under the supervision of a physician, dentist or veterinarian having possession or control by virtue of his employment or occupation and not on his own account, or to the possession of any of the aforesaid drugs which have been prescribed in good faith by a physician, dentist, or veterinarian or to any United States, state, county, municipal, district, territorial or insular officer or official who has possession of any of said drugs by reason of his official duties, or who, as an officer or duly appointed agent of any incorporated society for the suppression of vice, has the same in his possession for the purpose of assisting in the prosecution of violations of this act.

Section 9. The provisions of this act, except those sections which require the ordering of the above mentioned drugs on an official order blank and the keeping of the same on file, and the keeping of the record relative thereto, shall apply to cannabis indica and cannabis sativa, except that the same shall not apply to prescriptions, preparations or remedies which do not contain more than one half grain of extract of cannabis indica or more than one half grain of extract of cannabis sativa in one fluid ounce, or, if a solid or semi-solid preparation in the avoirdupois ounce, nor to liniments, ointments or other preparations containing cannabis indica and cannabis sativa, which are prepared for external use only.

Section 10. A manufacturer or jobber in drugs or wholesale druggist or registered pharmacist shall not be liable to prosecution if he fills any prescription or written order for a narcotic drug in good faith, unless he knows or has reasonable cause to suspect that the prescription or order was issued in violation of the provisions of this act, in which event any sale or delivery of a narcotic drug so made shall constitute an unlawful sale and delivery of a narcotic drug under this act.

Section 11. No physician, dentist, or veterinarian, and no druggist or pharmacist, either wholesale or retail, shall solicit by public advertisement or otherwise application to him for prescriptions for, or sales of, narcotic drugs, or shall publicly advertise any treatment the principal element of which consists in the administering, dispensing, furnishing, giving away or delivering of a narcotic drug, except, however, that wholesale druggists or manufacturing pharmacists may advertise in journals and publications intended for circulation among the medical profession and drug trade generally.

Section 12. All buildings, places or tenements which are resorted to by habitual users of narcotic drugs for the purpose of using such drugs, or which are used for the illegal keeping or sale of the same, shall be deemed common nuisances. Whoever keeps or maintains such a common nuisance shall be punished by a fine of not more than one hundred dollars, or by imprisonment for not more than one year.

Section 13. Whoever, not being a manufacturer or jobber of drugs, wholesale druggist, registered pharmacist, registered physician, registered veterinarian, registered dentist, nurse, acting under the direction of a physician, or an employee of an incorporated hospital acting under the direction of its superintendent or official in immediate charge, or a common carrier or messenger when transporting any drug mentioned herein between parties hereinbefore mentioned in the same package in which the drug was delivered to him for transportation, is found in possession thereof, except by reason of a physician's prescription lawfully and properly issued shall be punished by a fine of not more than one thousand dollars or by imprisonment for not more than three years in the house of correction.

Section 14. Whoever shall have in his possession a narcotic drug with intent unlawfully to sell and deliver such drug, or any part thereof, or whoever unlawfully sells, furnishes, gives away or delivers any narcotic drug in violation of the provisions of this act, shall be punished by imprisonment in the state prison for not more than three years, or in a jail or house of correction for not more than two years, or by a fine not exceeding two thousand dollars.

Section 15. It shall be unlawful for any person, not being a physician, dentist or a veterinarian, registered under the laws of this state or under the laws of the state in which he resides, wholesale druggist, manufacturing pharmacist, registered pharmacist, manufacturer of surgical instruments or any official of any government, having possession thereof by reason of his official duties, or a nurse, acting under the direction of a physician, or the employee of an incorporated hospital, acting under the directions of its superintendent or officer in immediate charge, or a carrier or messenger engaged in the transportation thereof, to have in his possession a hypodermic syringe, a hypodermic needle, or any instrument adapted for the use of narcotic drugs by subcutaneous injection. No such syringe, needle, or instrument shall be delivered or sold except to a registered pharmacist, physician, dentist, veterinarian, wholesale druggist, manufacturing pharmacist, a nurse upon the written order of a physician, or to an employee of an incorporated hospital upon the written order of its superintendent or officer in immediate charge. A record shall be kept by the person selling such instruments which shall give the date of the sale, the name and address of the person purchasing the same, and a description of the instrument. This record shall at all times be open to inspection by the state department of health, the board of registration in medicine, dentistry, veterinary medicine, and pharmacy, by the authorized agents of said department and boards, and by the police authorities and police officers of cities and towns. Any violation of this section shall be punishable by a fine of not more than one hundred dollars, or by imprisonment in the jail or house of correction for not more than six months, or by both such fine or imprisonment.

Section 16. In a prosecution under this act for unlawfully prescribing, selling, furnishing, giving way, or delivering a narcotic drug in violation of any provision of this act, it shall be sufficient to allege that the defendant did unlawfully prescribe, sell, furnish, give away, or deliver, as the case may be, the alleged narcotic drug, without any further allegations, and without expressly negativing the different exceptions of the act, and without naming the person for whom said prescription was issued, or the amount or quantitiy of the drug, or the person to whom such sale, furnishing, giving away or delivery was made; but the defendant shall be entitled to a bill of particulars under the provisions of section thirty-nine of chapter two hundred and eighteen of the Revised Laws.

Section 17. The defendant in a prosecution under this act who relies for his defence and justification upon a prescription, written order, registration, appointment, or authority as an excuse under this act, shall prove the same; and, until he has proved it, the presumption shall be that he is not so justified or authorized.

Section 18. The forms hereto annexed shall apply as well to complaints as to indictments, and such forms shall be sufficient in cases to which they are applicable. In other cases, forms as nearly like the forms hereto annexed as the nature of the case and the provisions of law will allow may be used; but any other form of indictment or complaint which is authorized by law may be used.

FORMS AND SCHEDULES OF PLEADING.

Common Nuisance.—That A. B., during the three months next before the finding of this indictment, at said [Boston], did keep and maintain a certain tenement resorted to by habitual users of narcotic drugs for the purpose of using narcotic drugs.

Unlawful Possession.—That A. B. did have in his possession, unlawfully, certain narcotic drugs, to wit, morphine (cocaine, heroin, or the name of drug as it is commonly known).

Unlawful Possession with Intent to Sell.—That A. B. did have in his possession with intent unlawfully to sell and deliver a certain narcotic drug (naming the drug).

Conspiracy.—That A. B. and C. D. conspired together to engage in unlawful traffic in narcotic drugs.

Sale and Delivery.—That A. B. did unlawfully sell (or give away, or deliver) a narcotic drug, to wit, morphine (or name drug is commonly known by).

Unlawful Prescribing and Delivery, etc., by Physicians, etc.—That A. B., a physician, (or pharmacist, dentist or veterinarian, etc.) did unlawfully prescribe (or sell, give away, furnish or deliver) a certain narcotic drug, to wit, (naming it).

Possession of Hypodermic Instrument.—That A. B. did have in his possession, unlawfully, a hypodermic syringe and needle.

Sale and Delivery of Hypodermic Instrument.—That A. B. did unlawfully sell (or deliver) a hypodermic syringe (or needle).

False Making Prescription.—That A. B. did falsely make (or alter) a prescription for a narcotic drug.

Uttering a False Prescription.—That A. B. did utter and publish as true a certain false prescription for a narcotic drug, well knowing the same to be falsely made (or altered).

Misrepresentation.—That A. B. did falsely represent to C. D. (a physician, dentist, veterinarian, pharmacist, etc.) for the purpose of obtaining a narcotic drug that (state the substance of the statements claimed to be representations).

DEFINITIONS.

Section 19. Terms used in this chapter shall be construed as follows, unless a different meaning is clearly apparent from the language or context, or unless such construction is consistent with the manifest intention of the legislature:—

"Narcotic drug" shall mean cannabis indica, coca leaves, or any cocaine, or any alpha, or beta, eucaine, or any synthetic substitute for them, or any salts, compound or derivative thereof, except decocainized coca leaves and preparations thereof, or any opium, morphine, heroin, codeine, or any preparation thereof, or any salt, compound or derivative of the same.

"Physician," "practitioner of medicine", "veterinarian", "veterinary surgeon", "dentist", shall mean persons duly registered and authorized to practice medicine, veterinary medicine, surgery, and dentistry.

"Druggist," "apothecary," or "pharmacist" shall mean a person duly registered under chapter seventy-six of the Revised Laws, and actively engaged as a practitioner, or employee, in an established and fixed place of business for the sale, compounding and dispensing of drugs.

"Persons" as used herein shall include all corporations, associations, partnerships, or other aggregations of individuals, including also their agents, clerks and salesmen.

"Opium", "morphine", heroin", "codeine" and "cocaine" as used in statutes or in complaints or indictments shall include any synthetic substitute for such drugs, or any salts, compounds, derivations, or preparations thereof, except decocainized coca leaves and preparations thereof.

Section 20. The repeal of any law by this act shall not affect any action, suit or prosecution pending at the time of the repeal for an offense committed, or for the recovery of a penalty, or forfeiture incurred, under any of the laws repealed.

Section 21. Any violation of the provisions of this act, the punishment for which is not specified herein, shall be punished by a fine of not more than one thousand dollars, or by imprisonment in a house of correction or jail for a term not exceeding one year, or by both such fine and imprisonment.

Section 22. Section three of chapter three hundred and seventy-two of the acts of the year nineteen hundred and eleven, as amended by section two of chapter two hundred and eighty-three of the acts of the year nineteen hundred and twelve, and chapter one hundred and eighty-seven of the General Acts of the year nineteen hundred and fifteen are hereby repealed. [*Approved May 23, 1917.*]

Harvard Medical School.

REPORT OF HARVARD INFANTILE PARALYSIS COMMISSION.

The Harvard Infantile Paralysis Commission, in coöperation with the Massachusetts State Department of Health, has been engaged since November of last year in providing proper after-care treatment for the children left crippled by infantile paralysis.

Clinics have been held for the children in and about Boston at the Children's Hospital and at the Massachusetts General Hospital. In addition clinics have been held throughout the State at the following places: Newburyport, Springfield, Quincy, Lynn, Beverly, Greenfield, Worcester, Malden, Melrose, Lawrence, North Adams, and Lowell.

While it was the original purpose of the Commission to confine itself to the treatment of the persons paralyzed in 1916, only, it was soon found necessary to care for those deformed by the disease prior to 1916. In all, 1114 individuals have been treated.

In 1916 there were reported to the State Department of Health 1917 cases of the disease. Of this number, 454 died. No paralysis resulted in 246 cases, and 303 were privately treated. There remained, therefore, 914 persons to be cared for by the Commission. The Commission has supplied treatment to 698 of this number, and its field agents have visited 142 more. Therefore, only 74 persons in the State have not been reached to date.

All the treatment and advice have been given free of charge, as well as much apparatus. Transportation has been supplied in many instances by volunteer automobile drivers. The work of the Commission will be maintained as long as the public contributions support the work and the children require treatment.

Obituary.

THOMAS DYSON WALKER, M.D.

Thomas Dyson Walker, M.D., a leading physician of St. John, N. B., and known to many friends in Boston, Mass., died on July 29, at the Massachusetts General Hospital, where he had gone the previous week for treatment. Dr. Walker was born in 1867, the son of Dr. Thomas Walker of St. John, N. B. In 1891 he graduated from Edinburgh University,—a leader in his class. After working in clinics in American and Canadian hospitals, he settled in practice in his native city in 1892. For many years he was a member of the staff of the General Public Hospital and held office in the New Brunswick Medical Association. He was much interested in the organization of the 8th Field Ambulance Corps in St. John and attained the rank of Lieutenant-Colonel in the Corps. Much to his disappointment, ill-health prevented his accompanying the Corps to foreign service. He was much beloved and esteemed by his many patients and friends, not only in St. John, but wherever he was known. He is survived by his parents, three sisters and three brothers, one of whom is Dr. William Dacre Walker of Andover, Mass.

Miscellany.

HAY-FEVER PREVENTION.

In a recent issue of the *Boston Transcript* a report is made of the efforts of the Public Health Service in controlling and preventing hay-fever.

"With one hay-fever season come and gone and another coming, the United States Public Health Service emphasizes the importance of educating the public in the noxiousness of the weeds which cause this most uncomfortable of diseases. When this has been done, it is pointed out, suitable legislation will be enacted. States enact stringent laws for the exclusion of parasites injurious to their agricultural interests, and hay-fever sufferers have the right to claim that they are entitled to equal consideration. In the eastern and southern parts of the United States, two distinct seasons of hay-fever make their appearance. The average dates are from May to July for the early form and from August to October for the autumnal form. The early form of hay-fever in this part of the country is due chiefly to the pollen of the Gramineæ, which includes the grasses, both wild and cultivated, and some of the cereals, such as rye, oats and wheat. Most hay-fever weeds are wind-pollinated, and for this reason corn, although it is a hay-fever producer in theory, is not reckoned practically among the miscreants. While one might acquire hay-fever in a corn field if he went after it, the size of its pollen is relatively so great (80 microns) that it causes few cases of hay-fever, and then only in close proximity to such crops. Rye and wheat also have large, heavy pollen grains (50 microns), which gives them a limited potential area of distribution by the wind. When it is considered that the pollen of the common ragweed weighs only 15 microns, the relative harmlessness of the cereals named is apparent.

The scientists estimate that eighty-five per cent. of the hay-fever cases are caused by the common and giant ragweeds. The disease can be produced in the laboratory from insect-pollinated and self-pollinated plants, but as their pollen is not found in the air and cannot, therefore, reach the nasal passages in ordinary respiration, they are not responisble for hay-fever. Wind-pollinated plants are characterized by inconspicuous flowers, which are without bright colors or scent, and by the large quantity of pollen which they generate. Many wind-pollinated plants, however, have pollen which does not produce hay-fever, like the pines, sedges, etc., or which cause reactions of a mild character, like the amaranths and docks. The trees, which are largely wind-pollinated and frequently distribute their pollen in enormous quantity, usually bloom in the spring, but rarely are responsible for hay-fever. The pines scatter their pollen about as freely as snow, but appear innocent of causing harm to the human race. The pollen of some of the oaks, willows, ailanthus and other trees give a mild reaction for hay-fever, but not enough to warrant taking them into account.

A study is now being made of hay-fever in the Western part of the country, but is embarrassed by lack of information among the health authorities of the Pacific and Rocky Mountain States as to the exciting causes of this disease. Hay-fever is found to be common throughout the Rocky Mountain and Pacific States, but the common ragweed, which is responsible for so much suffering in the East, is not generally found west of Kansas. But ragweed of the same family grows throughout the Far West, and along with the Western and burweed marsh elders, the sand bur, false ragweed and the cockleburs, so brings up the average of infection that the West has no need to be jealous of the East on the score of hay-fever.

Dr. William Scheppegrell, who has been studying hay-fever for ten months, kindly remarks that while describing the plants which are responsible for the disease, it is also opportune to say a few words regarding the rose and goldenrod. The rose is insect-pollinated and could, therefore, cause hay-fever only by direct inhalation, as the pollen is never found in the atmosphere. In addition to this, its reaction is practically negative, so that, in spite of the common term applied to the early hay-fever,—'rose cold,'—it is not responsible for hay-fever. The goldenrod has a spiculated pollen (20 by 22 microns), which gives a positive hay-fever reaction. The flowers, however, are insect-pollinated, and cause hay-fever only on direct inhalation or when used for ornamental purposes, as in room decorations. In most sections the goldenrod continues to bloom many weeks after the hay-fever season is over. In the atmospheric-pollen plates exposed in New Orleans during the whole of the last hay-fever season, the pollen of the goldenrod was never found. In spite of its bad reputation, therefore, the goldenrod is an insignificant factor in hay-fever.

Yellow fever has been eradicated from former plague spots and bids fair in time to disappear from the face of the earth, through the practical application of well-known scientific treatment. Typhoid epidemics are traced to their source and the cause removed, never to return again if people follow the instructions of the health authorities. Tuberculosis is controlled and cured, and some day will be unknown. The time should not be far distant when hay-fever should be as rare a disease, in the great cities and towns at least, as leprosy."

PUBLIC HEALTH NURSES IN WAR.

The following resolutions were recently adopted by the Advisory Board of the Boston Instructive District Nursing Association:

Whereas, The establishing of training camps all over the country may seriously affect the public health of surrounding communities; and

Whereas, By her special training, the public health nurse is fitted to cope with problems concerning the public health, and is the only available agent for the practical health teaching so essential in homes threatened by tuberculosis and other communicable diseases, such as venereal disease, scarlet fever, cerebrospinal meningitis, especially likely to be brought into communities near the concentration camps, and for the teaching in the care of themselves and their children prospective mothers who are being put into industrial positions, and is also peculiarly valuable in the home, teaching of food values, buying, and preparation of food, and are further and more than ever required in their capacity of social workers under these abnormal social conditions;

Whereas, Of the seventy thousand registered nurses in the country, only six thousand are public health nurses, be it

Resolved, That while there are other nurses available for Red Cross work, the Instructive District Nursing Association of Boston and the Baby Hygiene Association of Boston urges all public health nurses, for the present, to remain at their posts, and that it emphasizes the fact to the general public that by so remaining, the public health nurse is helping to conserve the most precious of our national resources, human life, and is serving her country no less truly than the nurse who goes to the front.

Endorsed by:

Massachusetts Committee on Public Safety,
Massachusetts Health Commission
(Dr. Allan J. McLaughlin),
Massachusetts Committee of Directors of
Visiting Nursing Association.

The Boston Medical and Surgical Journal

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The Massachusetts Medical Society.

MEETING OF THE SECTION OF HOSPITAL ADMINISTRATION, JUNE 12, 1917.

THE CHAIRMAN, DR. HOMER GAGE, Worcester: This is the first year of the Section of Hospital Administration, and its existence is due largely to the work of Dr. E. A. Codman in the meetings of the Clinical Surgical Society, which has brought to our minds, perhaps more forcibly than ever before, the necessity of doing something to find out whether our hospitals are really doing the work they are intended to do, that we think they are doing.

We have taken it for granted for a long time that hospital work is being done just as we think it ought to be done, but we have never undertaken any real method of standardizing hospitals, or the work in the hospitals, or of following up the results of hospital treatment to find out whether the hospital treatment was accomplishing what it was intended to accomplish. Of course it is money thrown away if a patient comes to a hospital for medical or surgical treatment and pretty soon after leaving the hospital has to return for more or further treatment, and if that is being repeated it simply means we are wasting our hospital endowment; and with the enormous increase in the number of hospitals it becomes apparent that some work must be done to find out exactly how we stand, and what our results are. We must have some means of determining the character and success of the work which we are doing, and it is the outgrowth of that feeling that led to the establishment of this Section.

THE FOLLOW-UP SYSTEM.

BY CHANNING C. SIMMONS, M.D., BOSTON.

THE end-result and follow-up systems in use at certain of the hospitals at the present time is a comparatively new development and is a distinct step in progress in the keeping of hospital records. Certain of the larger hospitals have adopted the determination of the end results of their cases as a routine part of the record work, and it is done automatically, while many others in good standing have as yet made no provision for it. The end-result work, to determine the results of treatment of cases treated at the institution, is distinct from the follow-up work in use in out-patient clinics, notably in the children's and orthopedic departments, and it is of the former only that I shall speak. I have been interested in the work since it was first started at the Massachusetts General Hospital. I do not refer to groups of cases worked up by individual men, but of the work as part of the record system of a hospital under the charge of the librarian or custodian of the records.

To determine the result of treatment of a surgical case and post this result in the record is, without question, of distinct advantage to the hospital, the science of surgery, the surgeon who performed the operation,—showing him his successes and his mistakes,—and, above all, to the patient. It completes the record of a case, and soon shows which operation, if there is a choice of two for a given condition, is the better, and whether one is better in one man's hands and a second in another's. It also allows the comparison of statistics of different men. I believe the personal equation comes in in surgery as much as in any other profession, and, although I believe in the efficiency propaganda, I think it can be overdone to the detriment of the patient; and when all is said, it is his condition we are trying to improve.

Mrs. Myers, the librarian of the Massachusetts General Hospital, made a trip last fall, visiting many of the larger hospitals in the country and studying their record systems, and I have been surprised in reading her report to learn how many of the larger hospitals in the country have no provision to determine the end results of the cases treated. I give below a list of nine hospitals, five of which are in Boston, that have some form of follow-up system, and the methods they employ. The end-result work is limited almost exclusively to the surgical cases, but I see no reason why it should not be extended to include some of the medical cases as well.

Massachusetts General Hospital. Letters are sent all surgical patients one year from the date of discharge, asking them to report at the hospital for examination, or write stating their present condition. If they report, they are examined in the accident room by the house surgeon. If there is no reply to the letter, nothing further is done, but if the letter is returned "unclaimed" a second is sent to a friend. In one year, as far as can be determined, about 75% of the cases were heard from, but in all probability in not over 60% was the information obtained by the hospital routine (2739 cases). The system is fair but far from perfect.

Peter Bent Brigham Hospital. A system similar to that at the Massachusetts General Hospital, and about as effective.

Collis P. Huntington Hospital. The end-result and follow-up work is in charge of a social worker, who does practically nothing else. For the three-year period, 1912-1914, 603 cases (95.6%) were followed. At present there are about 500 new cases a year.

Boston Dispensary. A very good follow-up system in charge of social workers. As this institution is practically only an out-patient clinic, there is little end-result work done (Howard[1]).

Carney Hospital. There is no provision for end-result as a part of the hospital routine. There is, however, a paid social worker following up the surgical cases, under the direction of Drs. Bottomley and MacAusland. She is developing an end-result system.

Presbyterian Hospital, New York. This hospital has, as far as I can determine, the best perfected end-result and follow-up system of any in the country. Carscaden[2] has described the system at length and says that for one year the results on 91.6% of the cases were determined (2278 cases). It is under the charge of a social worker.

New York Hospital. There is no end-result system maintained by the hospital. Dr. Gibson[3] has a system in force on his, the first surgical service, and Dr. Bancroft[4] a similar one on the second surgical service. Both of these systems are admirable and are in charge of social workers, but, as I understand it, are financed by the men themselves.

Michael Reese Hospital, Chicago. Letters are sent to all patients one year from the date of discharge, asking them to report for examination. The system is fair, but can be improved.

Mayo Clinic, Rochester, Minn. No regular system. If a surgeon wishes to follow up a group of cases, he is given the proper facilities, and the letter sent is passed on by a clinician, a surgeon, and a pathologist, to make sure all necessary questions are asked.

The above list is not intended as a full one of all the hospitals that have a follow-up system, but only to give a general idea of the methods employed.

The difficulties of the work vary as to the type of patients treated. In hospitals drawing patients from thickly settled districts, as the East Side of New York, it is fairly easy to trace cases and to get them to report for examination as, although they move often, they never move far from their original address. At the Massachusetts General Hospital, on the other hand, the patients come from all over the New England states, and it is difficult to get them to report, but as they are more intelligent than a foreign population and rarely move, they will usually answer a letter. Their friends are also easier to locate.

I believe that if the work is done properly and conscientiously, 90% of a group of surgical cases can be traced at the end of from three to five years. I personally have tried to determine the results in four groups of cases in the last ten years, and have been able to trace over 90% in each instance. These were as follows:

Cancer of the breast, 416 cases, 3 to 13 years after operation, 90.8% traced.

Cancer of the tongue, 112 cases, 3 to 8 years after operation, 93.7% traced.

Inguinal hernia, 162 cases, one year after operation, 93.8% traced.

Umbilical hernia, 70 cases, one to five years after operation, 91.5% traced.

These personal figures for cases at the Massachusetts General Hospital compare closely with those given for the Presbyterian and New York Hospitals, where the system is under the charge of a paid social worker and done automatically. It also shows that the class of patients makes very little difference.

At the Collis P. Huntington Hospital we have a social worker who does practically nothing else. She has developed a system of her own which, however, is applicable best to a small hospital of this type, averaging now about 500 patients a year. As this is a hospital for the treatment of malignant disease, no record is considered complete until the patient is dead from malignant or other disease. The figures for the three-year period, 1912-1914 (603 cases) are as follows:

Reported on account of letter sent	81	576 cases (95.4%)
Reported by letter	82	
Found to be dead	381	
Under regular observation	32	
Letters unanswered	16	27 cases
Letters returned unclaimed	11	

In establishing an end-result system there are certain points it is necessary to bear in mind in order that it should give the best results. In the first place, it is necessary to have the interest and active support of the visiting staff, not their passive acquiescence only. The staff must assist in the work and do all in their power to further it. If they do not like the methods the social worker or whoever else is in charge of the work employs, they should say so and do their best to correct errors, not grumble and find fault with the whole system. I think there is no question now that social service and allied work, properly supervised and administered, has come to be a recognized part of all well-organized hospitals. They must, however, work with and under the staff, not as two separate organizations under the same roof.

It is important the patient be told before his discharge that he will receive a letter asking him to report at a given time. It should be impressed on him that this is for his good, and that the doctors take an interest in him. Unless this is done many will pay no attention to letters, as they think the hospital is dunning them for an unpaid bill.

Time to Report. The ideal method is to have each case judged by itself, and told to report at a time deemed proper for that case. Three months is a good unit of time for most cases. Many will be well at the end of that time, and it will not be necessary to see them again. On the other hand, cases of carcinoma should be kept under observation for several years, and should report regularly every three to six months.

Examination. All cases, if possible, should be seen by the surgeon operating upon them, as he knows the case better than anyone else, and can see the results of his work, good or bad. If he cannot see them, someone having good judgment, in authority, and interested, should be delegated to the work—not a house officer.

It is of assistance to have the record, or a good abstract, in the examining room at the time the patient reports, as it is impossible to carry all the data in regard to a given case in one's head. After examination I believe all notes should be made in the record itself and signed. If more convenient for handling, the notes may also be made on a separate card similar to that advocated by Dr. Codman.[5, 6]

Suggestion for Establishing an End-Result System.—I believe all hospitals should have end-result reports on all cases, but the actual details of the system must depend, to some extent, on local conditions. I shall refer those interested to the articles already cited, rather than go into the details of a system. The hospitals that have adopted this work all have very much the same routine, although that at the Presbyterian, in New York, is probably the most perfected.

There are certain general suggestions which, if carried out, will make the work easier. The admission card of every patient should have the address of two friends, one of whom has a permanent address, as well as of the patient. If the patient is a woman, her Christian name, as well as that of her husband, should be obtained. It is also well to note the address of the physician or person recommending the case. Care should be taken to spell foreign names correctly.

The work should be under the control of the librarian or custodian of the records. It should be automatic and in charge of a full-time social worker, or similar trained person, and not left to a stenographer or ordinary clerk. It should take the full time of one person and part time of a second to do the work of a hospital having a discharge list of from 3000 to 4000 a year, but one of these only need be trained.

The worker should see each patient at the time of his discharge, and give him a card asking him to report at a given date, or explain to him, he will receive a letter about that date. At the time the patient is to report she should have the record in the examining room, and should also notify the surgeon. With a visible index file, the worker can easily keep track of the cases. If possible, the patients should be given the opportunity to report on an evening or Sunday, as to many, reporting in the daytime means giving up a half day's work. At the Massachusetts General Hospital the patients receive a letter asking them to report one year from the date of discharge, and this year I have notified patients I operated upon a year ago I would see them personally if they reported Sunday morning. From 5 to 12 report each week. If they report week days they are seen by the house officer in charge of the accident room. At the New York and Presbyterian Hospitals the staff meet once a week, see the cases operated on previously who are reporting, and discuss the work of the service. This is an ideal proceeding, but almost impossible of attainment.

If patients do not report, and do not reply to letters in a reasonable time, the worker should try the various methods used to trace cases. In 1912 I published a short paper[7] giving the methods I had found useful in tracing a given case. These suggestions are applicable, particularly to Massachusetts hospitals.

1. If there is no reply to letters sent, the worker should call at the patient's residence, and if he has moved make inquiries of the neighbors, laying stress on the fact that she is not a bill collector, but wishes to ascertain his health.
2. Write to the friends and physician.
3. Look up the patient or friends in the telephone book or in the local directory of the town in which they live, following them through year after year, till the change in address is found. (Directories of all towns in the state are in the office of the State Board of Charities in the State House.)
4. In cases of malignant disease, go through the files of deaths in the bureau of vital statistics at the State House, to rule out patients dead. (If you give the clerk a list of the correct names of the patients with the age and address and the probable date and cause of death, she will usually do this for you.)
5. If the patient comes from a small town, write to the postmaster or town clerk. They can usually give you some information.
6. Write to the state boards of health at the capitals of the New England states, inquiring if the patient died in that state.
7. The police will sometimes give you information if you tell them why you want it.
8. If you believe a patient with cancer to be living, but can get no reply to a letter, send him a registered letter. You will get his signature any way.
9. The Confidential Exchange of the Associated Charities has a record of many of the poorer cases.
10. Make all letters polite and personal. You are much more apt to get answers than if a "Neostyle" letter is sent.

There are many other methods of tracing cases that suggest themselves as one does this work.

I hope in the near future to see more of the leading hospitals adopt some form of end-result records and also to see the work done on the medical as well as the surgical cases, to which it is limited at present.

REFERENCES.

[1] Howard, A. A.: Jour. Am. Med. Assoc., 1916, Vol. lxv, p. 1962.
[2] Carscadden: Jour. Am. Med. Assoc., 1916, Vol. lxvi, p. 802.
[3] Gibson: Annals of Surgery, September, 1916.
[4] Bancroft: Johns Hopkins Hosp. Bull., 1916, Vol. xxvii, p. 261.
[5] Codman: Surg., Gyn. and Obst., January, 1914.
[6] Codman: Report of the second two years of the Codman Hospital.
[7] Simmons: Boston Medical and Surgical Journal, 1912, Vol. clxvii, p. 54.

DISCUSSION.

The Chairman: This is an important paper of Dr. Simmons, and very suggestive. There is one other means of looking up patients that has come to my notice lately, and it is in connection with what is really one of the most important works, medically, undertaken for a good many years. It is being undertaken at the Mayo Clinic, at the suggestion and practically by the request of the Medical Directors' Life Insurance Association, to try to get at what are the real results of operations. Dr. Charles Mayo read a paper before that Association in New York in October of last year on the relation of gall-bladder surgery to life insurance that was a little disappointing, and the disappointment was expressed simply because it did not give figures; it gave impressions only. It gave figures of the immediate successes or failures, but that was all.

As a result of that discussion, Dr. Mayo stated that they would be very glad indeed to extend the facilities of their records to the Medical Directors' Association, to determine according to actuarial methods exactly what the results were and to translate these into insurance language. That invitation was accepted, and the actuary of the New York Life Insurance Company went out there and they started an investigation on three lines: on the line of gall-bladder operations, on operations on gastric and duodenal ulcers, and on thyroids. Such knowledge is of such great importance to the insurance companies that they have said if, after these records are gone over carefully and everybody found out who can be found out by personal solicitation or by writing to friends, the list of those who cannot be found out be given to them, that the matter will be treated confidentially and the patients will be carefully looked up by their inspection systems. They believe that then they can get as good results as Dr. Simmons says he is getting when he puts his personal attention on the matter.

To my mind, the results of these investigations ought to be of immense importance. We have got a start in this work of Mayo's under very favorable conditions. It is more than the follow-up system; it is pretty nearly the end result of each case, and is going to show the mortality statistics in these cases—not necessarily the mortality due to the particular condition for which they entered the hospital, but its relation to their natural expectation of life; and all of these things are most interesting.

One other thing, about having these cases report on Sunday. At the Presbyterian Hospital the three surgeons at the head of the surgical division alternate in attendance on Sundays—first one is on duty and then the next, and so on. I endorse this plan. Someone of the visiting surgeons is there every Sunday morning, and the patients are requested to report at that time. This is of special importance in a large metropolitan hospital, where many of the cases cannot come at any other time.

Dr. Simmons' paper is open for discussion or suggestions.

Dr. P. E. Truesdale, Fall River: I would like to ask what the Massachusetts General Hospital will do, for instance, when its new private ward is established? Will the blanks or inquiries be sent to the doctors or directly to the patients?

Dr. Simmons, Boston: I personally could not answer that. I should suppose it would be regarded as a private hospital.

Dr. J. B. Howland, Boston: I should assume that these were private patients, and the doctors will do as they please with them.

Dr. Truesdale: What is the method at the Peter Bent Brigham Hospital?

Dr. Simmons: Letters are sent at the end of one year, and a second letter is sent if the first remains unanswered.

Dr. Truesdale: Are the letters sent to the patients or their physicians?

Dr. Simmons: To the patients. If the surgeon is interested in a certain line of cases letters may be sent also afterwards to the physicians.

Dr. Homer Gage, Worcester: I don't see why that method should not be followed out the same as followed in private practice, the same as I follow it in mine. I write the first letter to the patient and if I get no reply I write to the doctor from whom that patient was referred to me, or to the doctor who was connected with the case. Failing in that, I try to find if I have a record of some friend, and if it is a case in the hospital I have a record. In that way I am just getting together over 90% of the results of operations performed between 1898 and 1915.

I have been engaged in that sort of work for some time, and have never yet received a discourteous reply, nor have I ever heard of anyone who has.

Uniformity in Hospital Morbidity Reports.

By E. A. Codman, M.D., Boston.

What is the object of publishing morbidity tables and lists of operations in hospital reports? I have asked this question of several prominent physicians and surgeons, and also of a number of hospital superintendents. There is always a vagueness in the reply. The answers, boiled down to their simplest form, amount to this: To supply to those interested, information as to the kind of cases we treat, the kinds of operations we do, and the mortality from both disease and operation. When I ask, "Who are the persons who are interested in such matters?" the answers are still more vague. They show optimism that possibly hospital superintendents, trustees, subscribers, physicians and surgeons, boards of health, and statisticians may find some light therein. Practically they admit that very few, if any, laymen or doctors study or use these reports in any but the most general way. The Committee of the Council of the Massachusetts Medical Society, who studied this question last year, reported that: "Some idea of the relative frequency of diseases and injuries in a given community, and the immediate hospital mortality, are all that can be gained from the best of the hospital reports as at present prepared."

The truth is, that each hospital publishes these statistics as a sort of boast that it is doing something; the tables look well in a report, and impress the trustees and subscribers; otherwise than this they are not used by anybody. Anyone who might wish to use them knows that they are too inaccurate and too diverse in plan and method of classification to be of service either for comparison one with another, or for large statistics made by adding them one to another.

In order to give some idea of the variety of methods of classification used by the hospitals of Massachusetts, I have been over the reports of all the incorporated charitable hospitals. I find that scarcely two are exactly alike. All sorts of methods are used. Sometimes one even finds different methods used in the same hospital. Thus in the Boston City Hospital, medical diseases are classified by systems with subdivisions of pathology; surgical diseases are classified anatomically, with pathologic and systemic subdivisions. The skin cases are classified alphabetically, and some of the other departments have still further variations. I defy anybody to distinguish any general plan in the different classifications in the Children's Hospital report. I have made some lists showing in a general way what hospitals adhere to each of various forms of classification.

Those Arranged under Systems.—Pathologic or Anatomic Subdivisions.

Sturdy Memorial Hospital, Attleboro.
Beverly Hospital.
Boston City Hospital.
Children's Hospital.
Faulkner Hospital.
Deaconess Hospital.
New England Hospital.
Brockton Hospital.
Union Hospital—Fall River.
Lowell General.
St. John's Hospital—Lowell.
Malden Hospital.
St. Luke's Hospital—New Bedford.
Newton Hospital.
Wesson Memorial Hospital—Springfield.
Hampden Hospital.

Those of Mixed Nomenclature. More or Less Arbitrary, with Anatomic, Pathologic, Age, Sex or Conditions Subdivisions.

Cambridge Hospital.
Children's Hospital.
House of the Good Samaritan.
Infants' Hospital.
New England Hospital.
Massachusetts Homeopathic Hospital.
St. Ann's Hospital—Fall River.
Hale Hospital—Haverhill.
Newburyport Homeopathic Hospital.
Cooley Dickinson Hospital—Northampton.

Those Arranged Alphabetically, According to Pathology, Diagnosis, Anatomy, or a Mixture of These.

Boston Floating Hospital.
Massachusetts Homeopathic Hospital.
Peter Bent Brigham Hospital.
Clinton Hospital.
Framingham Hospital.
Heywood Hospital—Gardner.
Addison Gilbert Hospital—Gloucester.
Public Hospital—Greenfield.
Hale Hospital—Haverhill.
Holyoke City Hospital.
House of Providence Hospital—Holyoke.
Lawrence General Hospital.
St. John's Hospital—Lowell.
Ludlow Hospital.
Lynn Hospital.
Melrose Hospital.

Medford Hospital.
Anna Jaques Hospital—Newburyport.
North Adams Hospital.
Hillcrest Hospital—Pittsfield.
House of Mercy Hospital.
Jordan Hospital—Plymouth.
City Hospital of Quincy.
Salem Hospital.
Children's Island Sanitarium.
Somerville Hospital.
Mercy Hospital—Springfield.
Waltham Hospital.
Noble Hospital—Westfield.
St. Vincent Hospital—Worcester.
Worcester Hahnemann.

Those Arranged by Arbitrary Sections Modified from the International.

Hale Hospital—Haverhill.
Eye and Ear Infirmary.
Massachusetts General Hospital.

Those That Try to Combine the Diagnosis and Operation.

Carney Hospital.
Peter Bent Brigham Hospital.
Free Hospital for Women.
Clinton Hospital.
Burbank Hospital—Worcester.

Those Arranged on Individual or Original Plans.

The Waltham Baby Hospital.

This hospital, although it has very few cases in numbers, gives us a good example by listing the case number, diagnosis and result on the same line. Such a report could not be made unless the hospital were making an effort at efficiency, for the cases must be listed by consecutive numbers, must be diagnosed, the result noted, and made public in the report. If every hospital in the State followed the example of this little hospital, the reports would be of far more value than they are at present.

The Memorial Hospital of Worcester.

Such a report could not be made unless the staff were diagnosing their cases and grouping them, analyzing them, and making an effort to increase the efficiency of their treatment. It illustrates the possibility of using a double classification,—pathologic on the horizontal and anatomic on the vertical. It suggests that the chart from which the final statement is made, must be as good as a card index to the diagnoses. It is practical, and can be run by an intelligent clerk, if the staff coöperate.

The Codman Hospital.

In this report I have carried to the limit the following points, which I believe to be of fundamental importance.

1. Publicity. In each case under consecutive and permanent numbers an abstract is given of diagnosis, treatment, complications and immediate result.

2. End Result. Each case has been followed, if practicable, and an annual note made until death.

3. Classification. A detailed classification of diagnosis is given on the principle of the variable, using the Clinical Congress chart.

4. Index. The use of the classification as a practical index to every diagnosis is shown.

5. Efficiency analysis. A practical example is given of my own errors in diagnosis, judgment and skill, and the conclusions from a study of the analysis.

6. Professional ethics. A practical example of my own moral (or immoral) attitude in accepting for treatment a great variety of serious cases, is given to illustrate clearly how custom is the criterion of our professional morality.

7. Finance related to object of institution. A financial report illustrating how charitable hospitals, when run as competitive business institutions, may defeat their own object.

If single-handed I can do the professional work for 270 cases, record them, classify them, analyze them, trace their results, moralize over them (and still make a living), then it is clear that 10 men could do the same by 2700, which is a much larger number of cases, and smaller number of staff appointments than most hospitals have.

I think I have offered sufficient evidence to show: 1. That there is no uniformity at present in the reports of our hospitals. 2. That the hospitals are willing to spend time and money in making reports, even if they are not read or used. 3. That there is a great diversity of opinion as to the best form in which to present such reports. 4. That the energy, labor, expense and thought which are expended on making these reports is largely wasted, if not entirely misdirected.

The object of this paper is to suggest a method whereby this energy, labor, money and thought may be utilized. My suggestion is to make these hospital reports serve three distinct purposes.

The first is statistical or scientific. The second is a measure of efficiency. The third is to replace or reënforce a card index system to individual cases.

THE STATISTICAL AND SCIENTIFIC VALUE OF HOSPITAL REPORTS.

I think there can be no question that if all our hospitals had a uniform report, no matter how simple it was, that the added figures would form statistical and scientific data of value. For instance, if each hospital published a morbidity report which simply stated two headings,—one, Malignant Disease, and the other, All Other Pathologic Conditions,—that even this brief statement would be important. If we made five headings,—Malignant Conditions, Inflammatory Conditions, Tuberculous Conditions, Traumatic Conditions, All Other Conditions,—it would be even more valuable. I think that every one would admit that such a simple report, if given uniformly by every hospital, would be of far greater value than the elaborate reports on which our hospitals spend so much labor and money at present.

THE VALUE OF MORBIDITY REPORTS AS MEASURES OF EFFICIENCY.

No hospital can give efficient treatment to its cases, unless it knows the diagnoses of the conditions from which the patients suffer. To form a clear idea of the conditions for which we are treating the patient, is one of the most necessary steps in modern practice. The hospital which insists that this diagnosis of the condition is set down in black and white, has made one important step towards practical efficiency. Can we not use the morbidity report as a proof that diagnoses have been made and recorded? This proof will be immensely strengthened if each diagnosis is followed by a list of case numbers, so that those authorized or interested may refer to the detail of any case in question.

THE VALUE OF A MORBIDITY REPORT WHEN USED AS AN INDEX.

Let us suppose that a small hospital treats only 100 cases a year, and that each of these cases receives a consecutive number. Suppose that 25 of these cases had some form of cancer. The report at the end of the year might divide all their diagnoses into "Malignant Conditions" and "Other Conditions." Following the words "Malignant Conditions" would follow the individual numbers of the cases. Following the words "Other Conditions" would come the individual numbers of all the other cases. Suppose one of the staff wished to review all the cases of cancer of the breast. He would merely have to look through twenty-five numbers to find all the cases of cancer of the breast. This would be considerably easier than looking through the whole hundred numbers, but the same simple division applies to cancer of any other organ. It would be just as easy for him to look up cancer of the uterus. Vice versa, if he wished to look up tuberculosis of the wrist, he would have to look through seventy-five numbers, but he would have to look through only seventy-five numbers for any other diagnosis. What earthly use could there be for a hospital which has 100 cases a year to subdivide any further?

But suppose a hospital which ran 1000 cases a year. In such a hospital there might be 250 cases of malignant disease. In this case it would be more convenient to have six subheadings under Malignant Disease, with the number of each case following. The trouble which the investigator would encounter would be no more than he would encounter in the small hospital; he would have to pick out the cases he wanted from only twenty-five numbers. Suppose the hospital treated 10,000 cases. There would be 2500 cases of malignant disease which could be still further subdivided, so that each group would contain twenty-five or less, unless more than twenty-five occurred under some definite, clearly defined subheading—such as cancer of the breast; in which case the investigator would have no trouble at all in going direct to his records.

I wish I had the time, and you had the interest to hear a discussion of the relative merits of the different forms of classification which at present exist in Massachusetts. No doubt each has its merits, and each is sanctioned by the custom in the local hospital. In my opinion, by far the best is that used at the Memorial Hospital in Worcester. I wish that we might all copy that method, so that it would be at least uniform. Anyone who has studied the morbidity report of the Memorial Hospital will be convinced that such a report could not be made unless its staff were making an effort at scientific, statistical accuracy, at clinical efficiency, and at permanent scientific records, practically and carefully indexed.

I should like to make the following suggestions to the hospitals of Massachusetts:

1. Begin the new year with a new set of numbers, assigning these numbers consecutively to each house patient. Let each patient keep the same number, no matter how many times he returns, whether he reënters with the same or different diagnoses.

2. Let each hospital keep a chart on which the diagnoses are in two divisions,—"Malignant Disease" and "Other Pathologic Conditions." At the time of the discharge of each patient, record on this chart the number of each patient under the appropriate heading.

3. Let each hospital, when it issues the annual report in 1919, publish a simple statement, giving the total sum of all the diagnoses reported under "Malignant Disease" and "Other Pathologic Conditions."

4. Let each hospital appoint a member of its staff to meet with the other appointees of all other hospitals which adopt this suggestion, and then this group can formulate further subdivision of diagnoses for future reports.

If these simple suggestions meet with favor, by 1920 the hospitals of Massachusetts will have before them a simple method of proving to their trustees, staff and subscribers that they are making an effort at accuracy, efficiency and scientific record. The morbidity statistics which would be gained by the sum of these reports in 1920 would be an example to the whole world.

This plan requires some effort, because it is new, but the total effort, labor and expense would be far less than what we expend at present, and for which we get no real return.

What a pity it is that this subject is so uninteresting! Here we have a chance to get together on something which would help us all and generations after us.

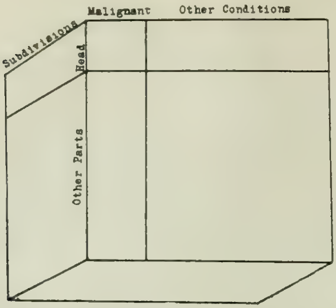
A more elaborate discussion of this plan from my own point of view will appear in a paper which I gave before the surgical section of the American Medical Association on June 7, and also in the forthcoming report of my own hospital.

EXPLANATION OF FIGURE.

By the use of three dimensions this system may be used in the smallest as well as in the largest hospitals. For small numbers of cases it may be linear, for larger numbers it may be rectangular, and as a cube it will provide for infinite numbers.

If some large medical society, like the American Medical Association or the American College of Surgeons, should recommend its universal use, a standard card index cabinet could be made, and sold at cost to all hospitals.

Each card would contain only the name of a sub-



Basic Plan of a Card Catalogue Cabinet for Standard Hospital Use.

A suggestion for a system of classification and case reference index of diseases, based on the principle of the variable increasing toward its limit, and which acknowledges that the finite is infinitely imperfect, but believes that the infinite may be made finitely perfect.

Consecutive and permanent case numbers are essential. Begin a new series on January 1, 1918.

Note.—With this figure the chart recommended by the Clinical Congress of Surgeons was shown. It is an amplification of the above basic plan. It is not reprinted here on account of the expense, but copies may be had by applying to Dr. E. A. Codman, 15 Pinckney St., Boston. The following explanation refers to both this figure and the chart.

division, followed by the numbers of the cases in which this diagnosis was made.

By the use of such a system a large hospital would have a practical, immediate index to all its cases, as easy to use as that of a book. Besides being an index and a scientific classification, it would be an up-to-date statistical table of each disease, class of disease or anatomic regions affected by individual diseases. Besides these advantages, it would be of great assistance in efficiency studies and an incentive toward accurate, careful work for the coming generation.

It is better than the International List, the Bellevue Classification, the Lambert Classification or any other present classification, because its subdivisions are scientific, not arbitrary, and because it is not dependent on a nomenclature, or on our present-day knowledge.

Take cystic disease of the breast, for instance, which has a multitude of names. Whatever we call it, it must appear under "Breast," and the only question is under which pathologic heading to place it. A single cyst might be considered a new growth and so classified. But if our future pathologic advance shows that such new growths are really chronic inflammatory conditions, we have merely to transfer the numbers to the chronic inflammatory division. We must admit that our pathologic knowledge is infinitely imperfect, but to use what we have is better than using mere names. Thus whatever language we speak, and whichever term we prefer for cystic disease of the breast, we shall all know what we mean by each other's names. Rather than discuss names, let us agree to spend our energy on investigations to determine whether the condition is inflammatory, neoplastic or degenerative, and admit that we do not yet know. If we have no opinion, we can put it under "other conditions" and transfer it later when we find the truth. Thus by not using names our chart is made elastic.

This method of classification has one "practical" disadvantage. It cannot be wholly in charge of a non-professional clerk. My answer to this is that it should not be. It is too fundamental and important, and needs the attention of the chiefs of staff or some subordinate who is delegated to this work, because better fitted for it than the chief of staff.

To the chief of staff it should be of the utmost importance to know that he has an accurate index which will enable him to find at once the records of any particular group of cases. He should be constantly reviewing such groups and assigning the unsatisfactory ones to his subordinates for study.

But unless we use a merit system of promotion instead of a seniority system, there will be no incentive for clinical accuracy. *The struggle for existence must be utilized to give the truthful and efficient an opportunity to survive.* Like the individuals in the coral reef, each must be made to add his bit to the advance of clinical science.

DISCUSSION.

The Chairman: I happened to be a member of that committee of the Council which looked up the matter of hospital reports in Massachusetts, and we found that almost every hospital in Massachusetts made a report, but that no two of them agreed on the way that report was to be made up. Everyone that replied to our inquiry, I think, exhibited a willingness to cooperate, especially if the plan could be shown to be economical—and there is no question but what this plan is economical. It is much more economical than the present plan, which involves not only a great deal of labor, but much paper, etc.

Dr. Codman: If there is a little time, I should like to show something I have brought. The Harvard Medical School in China, which has a hospital combined with the Red Cross until recently, was the only hospital which followed the plan which I suggested in its entirety and rendered a report similar to my own report, so that I could get a direct comparison between their work and mine. The work there was done by Dr. Hedblom, formerly a house officer of the Massachusetts General, and now at the Mayo Clinic. By taking these two charts I can show any of you who are interested that it is possible to compare my cases and their end-results individually or statistically with those of that hospital in China.

You can get a general idea of these two charts. They are on the same principle. Each one of these little rectangles contains the case numbers of the diagnoses which he made in China and which I made here. This is Dr. Hedblom's chart and this is mine. The cases, for instance, of malignant diseases of the neck in my chart were four and in his were six. If I wanted to look up some particular form of malignant disease of the neck, all I would have to do is to look in his reports at his six numbers and in mine at four. No matter what diagnosis you mention, I can find it in both charts if an instance of that disease has occurred. It may be such an unusual condition that it has no name, but it would be filed anatomically and pathologically in the proper place.

Dr. Samuel B. Woodward, Worcester: How does your system compare with that of the Memorial Hospital in Worcester?

Dr. Codman: It is much the same. The way the subdivisions are made is immaterial. I gave my best thought to this for months, and my subdivisions vary but little from Dr. Gage's in Worcester, perhaps because the natural processes of the human mind are similar. Practically you could use the Memorial Hospital chart to compare with mine, although some of the subdivisions are different.

The Chairman: The next paper will be on "The Standardization of Hospitals," by Mr. John G. Bowman.

You will remember that several years ago the Carnegie Foundation investigated the medical schools of the country, and it was stated by many at the start that the investigation would not result in any practical benefit and that there was a question as to whether a proper comparison could be made. Some thought it was useless; but a great deal of good has come out of the investigation, in the elimination of inconstant schools, schools that were poorly equipped, and schools that were doing poor work. The natural suggestion following that is to see what we could do in the same way in the investigation of hospitals throughout the country, classifying them A, B, C or D, as the medical schools were classified. A great deal of preliminary work has been done along that line, and Mr. Bowman is the man in charge of it.

The Standardization of Hospitals.*

By John G. Bowman, Chicago,

Director, American College of Surgeons, Chicago.

We are in the midst of a world war and are much "tumbled up and down" in our minds. We are also at the beginning of a new era of hospital advancement, and these facts are all closely related. The history of hospitals is a series of waves of advancement, each stimulated by war. Today service and ideals of service will win or lose the greatest contest in history; and what this service means is being hammered into every man, woman, and child in this country. This fact is a benefit of war. And it follows now, as never before in history, that any hospital which is to survive must serve. It must be fair, it must be honest, it must be unselfish, it must be competent. The requirements are a big order to fill.

The impetus of service, which is in the air we breathe today, promises almost a revolution among hospitals. That revolution is already under way, and its further progress is inevitable.

In order to look forward with some intelligence, let us for a moment look backward. About ten years ago the condition of our medical schools was brought sharply to review. We took stock of ourselves. We realized with new force that a medical school is a public institution and that its mission is service. We found when tested by this conception that many established practices of the schools must stop short. For example, it not infrequently happened that when a chair of surgery fell vacant, the chair would be sold practically at auction to a surgeon. The price sometimes went as high as $10,000. The successful bidder then took up his trust, not to teach with a true ideal of service, but rather to impress his students with his own attainments. Students, according to his dictates, were not to attempt independent surgery; they were to send their cases to the professor of surgery, and the professor would "treat them right." As for the rest of the course, it was didactic. There was very little laboratory work, and a minimum of the ideal of service which characterizes any real profession.

Again, in one city there were a number of rival medical schools such as these, each with its so-called "runner." Part of the duty of this individual was to get up early in the morning and to meet workmen who looked as though they might be students,—a plumber, perhaps, going to work with his kit under his arm. The "runner" would say to him: "My boy, you are in wrong. You are doing hard work with small pay. Take a course in our medical school and in a couple of winters you will be socially in a better class, and you can make much more money for less work. It's all easy." This appealed to the boy. He would drop his kit and start off for the medical school. After a few winters this boy would enter the medical profession with little conception of what a profession means; he was merely in another trade or "game."

In less than ten years this type of medical school has disappeared in this country. Scores of such schools closed their doors. We have made headway. To maintain a medical school today "for profit" is unthinkable; and in my opinion no intelligent community would tolerate such an effort in its midst.

Comes now from a number of directions a similar questioning into the function of hospitals and of their performance. The questions are many and pertinent; and they spring from good motives. But what will be the result?

In talking on this subject let us not consider that hospital standardization means the making of hospitals alike. Each hospital should be given full play of individualism to render such services as best fulfil the needs of its community. What nonsense, for example, it would be to ask of Harvard University and the University of Virginia to standardize themselves according to a single mould! These institutions grew up out of different conditions, tempers, and demands. Both are rendering priceless services to their communities, and the very individualism of each is a telling factor in its success. In a similar fashion there is place for individualism among hospitals. There are only certain fundamental principles on which we may wisely insist, such as, for example, that the procedure in any department be guided by high professional training and integrity.

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* Stenographic report condensed.

Let me explain concretely this last statement. About four or five weeks ago on the Pacific Coast I visited a hospital of about 300 beds. Practically every bed in the building was occupied. The construction was beautiful, expensive, and adequate. But what about the integrity of the institution toward the patient? There was not in that building a microscope or anything that could by stretch of the imagination be called a laboratory. There was not an interne nor a house physician. There was not a case record of any kind. There was an odd x-ray machine, but no one knew how to operate it. They hoped to have a laboratory by and by. The superficial evidence at least was not such as to inspire confidence.

You know what the medical and surgical procedure must be in such a hospital. Surgery without adequate diagnoses, and medicine which bears too close a likeness to sheer guess-work, are inevitable. Nor are the conditions just described exceptional; they are usual over a large part of this country. And the time is arrived when we must take the facts home to ourselves, stop all footless discussion, and act.

What are some of the first things that we have, then, to do? First, the facts with regard to the efficiency of the hospital, and the meaning of these facts in relation to the welfare of patients, must be brought home to the boards of trustees or the governing authorities, whatever they may be. The inidvidual trustee must feel his responsibility; he must realize keenly his position of trust. The hospital is a public institution, no matter who owns it, and it is accountable to the public for the character of its work. A great majority of hospital trustees, in my opinion, have only a hazy idea of what their trusteeships mean. For example, if in one hospital in a community there is a mortality of 18% among appendicitis cases, and in another hospital a mortality of 3% among similar cases, the time has come for many pertinent questions. Do the trustees ask the questions? Has the public a right to ask questions? If you were to be operated upon for appendicitis in that community, would you ask questions?

But to come closer to the situation: what steps may the board take toward honest, competent service? The first answer to the question is that the board may withdraw the privileges of hospital from any doctor who divides fees. This subject is not a pleasing one to talk about. The practice of division of fees is a disgrace to the profession; it is a national disgrace. It means invariably operations performed by incompetent men; it means unnecessary operations, and it means the lowering of the entire profession into a mire of dishonesty. The subject does not need elaboration here.

In about fifteen states of the Union today the practice of division of fees is prohibited by law. The penalty provided is usually to revoke the doctor's license and to impose a fine or a term in prison, or both. Copies of these laws are now framed and hung in conspicuous places in some hospitals. Certainly in all hospitals, the boards of trustees can take effective means to put an end to the practice in their respective hospitals. Any board is unworthy of its trust which does not squarely meet the issue.

A second leading consideration for the board of trustees is the adequacy of the diagnoses. And this subject leads us at once to the hospital laboratory. Where are the essential physical findings to be made if not in the hospital laboratory? Let me ask you frankly what percentage of surgical operations are performed in hospitals after all data which might throw light upon the illness of the patients have been obtained? In a local medical society recently a surgeon ventured the opinion that not in more than 20% of the surgical cases were adequate diagnoses made. Now what are the facts in each of your hospitals? What are you doing in the way of progress for better conditions? What are your boards doing? What will the public do when it comes to realize fully the vast unnecessary mortality because of negligence of right procedure?

But the acquisition of data in connection with diagnoses is only part of the function of a hospital laboratory. The laboratory serves also as a source of scientific incentive. It is a chief means to keep the physicians and surgeons of a community in line with the swift progress of medicine; and the value of such an influence is a thing which no community can overestimate.

In passing this subject let me make this suggestion: It is that no surgical operation be permitted in your hospitals unless a diagnosis in each case is posted in the operating room in advance of the operation. This diagnosis, then, is to become part of the permanent case record; and before the surgeon leaves the operating room he should dictate an exact statement of the findings and what happened at the operation, which statement is to become also part of the permanent case record.

Now a third consideration,—the keeping of case records. The keeping of complete records is not merely nice bookkeeping. It is a pledge of integrity to the public. It is one of the strongest means at the command of the profession to acquire that position of confidence in our social fabric to which it is entitled. There can be only one science of medicine; and it is the business of that science from time to time to give to the public, in accurate and intelligible form, the results of its work. Further, you in the medical profession should insist that all others who claim to treat or cure human illness, publish accurate and intelligible reports of their work. When such procedure is usual among us, all of the curious mysticism now associated with medicine will disappear, and the barometer of confidence in the profession will rise to an inspiring figure. Dr. Codman has presented an admirable paper on this subject here this afternoon, and most heartily I wish to endorse his contention.

There are many other subjects which we might discuss this afternoon in connection with hospital standardization. The training of internes and of nurses, financial problems, equipment, etc., are among these. But time here permits only a general survey.

The American College of Surgeons has undertaken with great seriousness a standardization of hospitals in the United States and Canada. Many years and expenditure of much money and effort will be required before telling results are obtained. But to start with, the college asks the good will and coöperation of the hospitals and of medical schools. It asks that, with the highest medical patriotism in us, we band together for the better welfare of those who are ill. The motive is not to criticize for the sake of criticism, nor to destroy, but rather to construct, to lead in a progress of heart and hands and head such as is yet unrecorded in the history of medicine.

DISCUSSION.

Dr. Michael F. Fallon, Worcester: Can you tell us what states, if any, have provision for the standardization and supervision of hospitals?

Mr. Bowman: The State of Pennsylvania has unquestionably taken the lead in this matter. Hospitals coming up to a given standard are allowed some subsidy from the state, according to the number of beds. Under the guidance especially of Dr. Baldy, the state has made great headway toward better conditions. New Jersey and Minnesota are also giving the subject increasing attention.

Dr. Lester Newman, San Francisco: In speaking of the Pacific Coast I would like to ask Mr. Bowman what individual city he has reference to. We have several cities there, as you have on the Atlantic Coast. It would be unfair to speak of the Atlantic Coast as Baltimore, or Boston, or even New York. To speak of the Pacific Coast is just as comprehensive a statement.

Mr. Bowman: Let me say, first, that in San Francisco, Portland, and Vancouver (I do not know about Los Angeles), there are very well-managed hospitals with excellent laboratories. Vancouver is especially alive to its needs. The particular hospital I spoke of was on the Pacific Coast, but it will be kinder not to say specifically where.

Dr. Lester Newman, San Francisco: In some respects we think we are rather setting the pace, and I speak advisedly. I have spent some of my time in New England and twenty-five years in Chicago, and I am also interested in this as a Californian, and have to speak out. The diagnostic clinic in my mind is one of the means of bringing hospitals to a high standard, and we have two such endowed. They are there to stay, we hope, and their quality is unquestionable. They are equipped with pathologists and all the accessories, and the patients are diagnosed before they are taken into the operating room, which to my mind is a very important matter in this day of promiscuous surgery. It is a step in the right direction, and I wish to emphasize the fact that there are a few things done on the Pacific Coast just according to Mr. Bowman's ideas, and I am with him every time. It is very important at this immediate time, and I simply want to say that we are with you and working hard.

Dr. H. B. Howard, Boston: When the College of Surgeons started this idea of standardizing hospitals I felt it was a good beginning. It seems to me that if they formulate clearly the essentials which should be in a hospital for a given amount of surgery, and publish these standards, being careful not to over-standardize, they will find that the hospitals will struggle everlastingly to meet these standards.

So far as my experience goes, it does not seem to me, at least, that there can be very much splitting of fees; that we have need to have very drastic laws against that practice. Personally, I never met a man who I knew split fees in New England, and though I would not want to say there were none in Massachusetts, I cannot think of anyone who would be guilty of that. I practised in the West, as far west as Colorado, for three years and I did not meet a surgeon there who even offered to divide with me 50-50. I didn't meet a surgeon who ever approached me in any improper manner. That was some time ago, and it may be that they have grown worse in the last 25 years.

I believe thoroughly in the matter of progress in standardizing hospitals. There is a great chance for good work in that direction.

I would like to go back to Dr. Codman's paper if I could. So much was said against our whole statistics. The Massachusetts General Hospital tried to omit the statistics of the medical and surgical work the year before I became superintendent, because the trustees thought them absolutely useless. I want to say that it annoyed them so during the year, answering questions and letters about it, that there was no question but that the statistics should be published, poor as they were. I admit that they are always open to improvement. I am glad to see that Dr. Codman makes such an effort and spends so much time on improving the statistics of our hospitals. There is room for more improvement, and I was glad to hear him say that there were no limits to which we could go, because so far as I have seen, this agitation has always been going on. If you will look through the statistics of 25 years ago and compare them with what the ordinary hospital is doing today, you will find that there are distinct improvements, even in the ordinary hospital. They come closer and closer to a correct diagnosis and there is more and more care taken about it.

In regard to the diagram method, there is no question in my mind but that would apply beautifully to the small hospital, but I still question whether you are going to be able to get the diagrams of a large hospital like the Massachusetts General and the City Hospital to synchronize. I don't feel so sure of that as Dr. Codman does. It is a great thing to have started, though, and I know there is room for improvement.

It is the same thing with our insane institutions in the state. Those statistics have been gone over and improved and started upon a fresh basis and re-improved at least ten or fifteen times in my remembrance. I am not willing to admit that they have made no progress, but there is room for still more. I think that superintendents will all admit that if you do the best you can to tabulate what is taking place, that that is of importance.

Efficiency Tests Applied to the Attending and House Physicians of the Cook County Hospital, Chicago.

By Joseph A. Capps, M.D., Chicago,

Chief of the Medical Staff, Cook County Hospital.

For the past three years an experiment in efficiency has been carried out with the professional staff of the Cook County Hospital. The principles of the merit system, long in use by the Civil Service Commission, have been extended to the daily work of the hospital physicians. The success of the scheme has been made possible by the enthusiastic interest and devotion of the Efficiency Committee,—a group of specialists not on the staff, who have given time and thought to its perfection. The staff also has coöperated by closer attention to ward work and by sympathetic discussion and criticism, to the end of improving the standards.

A certain amount of expected hostility to supervision developed at first on the part of the staff physicians, accustomed, as they were to independence and authority; but this has melted away as the advantages of the system have become apparent. There is no exaggeration in the statement that never before have the patients been so well cared for and never has the routine medical work been so consistently and thoroughly carried out as under the new efficiency plan.

I propose to present in brief outline the methods employed.

The unit of service is 50 beds, with one senior and one associate attending physician, a senior and a junior interne. The markings are made upon the entire team on a service, each individual contributing his share to the total. The Efficiency Committee gives one to two evenings each month to the task of computing the marks.

The Committee is provided with the following items of information:

A. Post-mortem records for the month. The number of deaths is about 12 each day.
B. The bedside diagnosis of each post-mortem case.
C. The records of 5 histories from each service selected at random.
D. The reports of the social or welfare workers, with reference to "satisfaction of patients."
E. Letters from departmental chiefs, regarding excellence or neglect on the part of the staff.
F. Publications and papers read by members of any unit before medical societies.
G. A record of the hours spent at the hospital by attending men.
H. A record of attendance at the regular monthly staff meetings.

With this material at hand, the markings are made according to the following efficiency standards, using the mark of 80% as a basis for addition or subtraction:

1. For each hour in attendance in excess of the legal requirement of 18 hours a month, a credit of 1/5 point is given up to a maximum of 3 points.
2. For failure to attend staff meeting, a deduction of 1 point.
3. For each history sheet omitted, a deduction of 5 points. For excellence of histories as a whole a maximum credit of 10 points. For inferiority, a maximum deduction of 10 points.

The following details in the histories are noted in computing the totals:

(*a*) Account of present complaint.
(b) Account of patient's past history.
(*c*) Account of patient's family history.
(*d*) Account of physical examination.
(*e*) Proper notes on patient's progress during treatment and complete summary upon discharge.
(*f*) Complete description of patient's condition upon discharge.
(*g*) Adequate account of laboratory findings.
(*h*) Quality and completeness of record taken as a whole.

4. For promptness in making and completing records, maximum credit 5 points. For delay in making and completing records, maximum deduction 5 points.
5. For adequate and complete description of operation or of reduction of fractures, a maximum credit or deduction of 3 points.
6. For services having during the month five or more deaths and no post-mortems, deduction 2 points. For success in obtaining post mortems, credit according to percentage up to a maximum of 4 points.
7. For diagnosis checked by post mortem, credit or deduction to maximum of 5 points. The post-mortem data are furnished by the resident pathologist.
8. For failure to enter clinical diagnosis and fill in diagnostic sheet, previous to discharge or death, deduction to maximum of 5 points.
9. (*a*) For publications and articles of merit during the year, a maximum credit of 10 points. For failure in such productive work a deduction is made.
    (*b*) Similar markings are made for the internes.
    (*c*) Special work by internes, approved by the committee may be credited by 2 points.
10. Certain persons, designated by the Civil Service Commission, examine each ward monthly for cleanliness of patients, floors, windows and equipment and upon the pres-

ence of prescribed articles of equipment, such as clothing, food and medicines. The service unit is given a credit or demerit of 5 points.

11. Welfare workers report on "satisfaction" or dissatisfaction of patients. Credit or demerit, 2 points.
12. For histories returned by librarian to internes for correction, deduction 1/2 point.

For the guidance of the internes there is posted in the examining room of each service a printed sheet of "Standardized Clinical Observations," which outlines the required special examinations of certain groups of diseases. For example, meningitis in every case demands:

1. Blood culture.
2. Spinal puncture, total and differential cell count, culture of fluid withdrawn, and pressure of fluid.
3. Leucocyte count.
4. Examination of eye grounds.

In this way a level of efficiency is maintained throughout the hospital.

Every month the markings of each service during the preceding month are posted in a conspicuous place in the main corridor. A friendly rivalry between the teams is created, and every lazy man is spurred on to his best endeavor in order that his team score may be creditable.

The driving power for this rather complicated machinery is entrusted to the executive committee, which is composed of the president of the staff, the warden and the chiefs of departments. This committee meets one evening of each month, and considers matters affecting the welfare of patients, physicians and scientific workers, as well as broader questions of hospital policy. Recommendations are made for final action to the general staff at its regular monthly meetings. The staff meetings are well attended and made interesting by general discussion of live topics. These meetings are open to the county administrators, the civil service commissioners, to the warden and assistant wardens (superintendents), to representatives of the interne body, and to the heads of the training school for nurses. In this way a free exchange of opinion between the various hospital groups has been fostered, and as a consequence the friction that arises from misunderstanding has been largely eliminated.

This sketchy description of the efficiency system reveals many glaring defects in the attempt to place a value on medical skill and service. Such important qualities as therapeutic skill, surgical judgment and dexterity are not even recognized. It seems impossible to pass judgment upon such subtle personal traits.

The methods are imperfect, but if they are considered only as a means to an end, namely, the development and maintenance of a higher standard of efficiency in the routine work of the hospital, they have been abundantly justified. Furthermore, they have had no little influence in promoting an interest on the part of the professional staff, not simply in the individual's own ward, but in the hospital as a whole.

DISCUSSION.

Dr. H. B. Howard, Boston: An immense amount of work can be done along the lines laid out here by Dr. Capps. All it needs is a spirit of fairness to run through the whole thing, and if the spirit of fairness does run through it, so that real merit counts and credit is given for actual work done, I think any system of that sort will bring good results. I think that it needs only a little time, a little discussion and a little more thorough understanding by the different departments in the hospitals before they make and adopt customs of this sort.

I was in the Presbyterian Hospital in New York City a short time ago, and I think that the custom of recording the time of entering and leaving the hospital on the time-clock had been adopted by the staff. When I was at the Massachusetts General Hospital the Trustees found that the record of the Out-Patient Department in regard to the staff attendance was not being well carried out in the spirit they had asked for. Dr. Capps may remember about it as he was a student there then. The arrangement was made so that a sheet of paper was placed there after that for the men to record their entrance and exit for service. It took only a little interest on the part of the Trustees to found that system so that it went for years, and I suppose it is still going, so that it was almost absolutely accurate and they knew just how much time a man spent there. It was a record, and the man could find no fault with it because he made it himself, and the record was placed in such a conspicuous place that even the one or two who would have made a false record didn't dare to.

I appreciate Dr. Capps' paper very much, and the spirit of improvement which it will bring.

Original Articles.

THE SIGNIFICANCE OF PERSISTENT PAIN OR OTHER SYMPTOMS REFERRED TO THE PERIPHERAL NERVES.

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INTRODUCTORY REMARKS.

Along with the advance in specialization there has come the tendency on the part of the specialist to narrow his interest, as well as his proficiency, in the recognition of diseases other than those with which he is particularly equipped to deal. In like manner, the general practitioner, overawed by the rapid advance of specialism, has shown a tendency to the shirking of responsibility for making a reasonably accurate diagnosis in a long-standing or obscure condition, and, therefore, has allowed the patient, in many instances, to drift from one specialist to another of his own accord, or to drift into the hands of the charlatan, thus wasting valuable time in arriving at a diagnosis, and perhaps undergoing expensive, painful and unnecessary treatment before a diagnosis is reached. Should not the general practitioner and the specialist, also, be sufficiently acquainted with all the general aspects of disease properly to diagnose and hence properly refer the patient for special treatment, if he is not himself equipped to deal with the disorder?

Probably there is no symptom for which so many diagnoses may be offered as that of chronic pain referred along the peripheral nerves. This paper represents an effort to enumerate the most important conditions responsible for persistent pain of obscure origin and to classify them according to their etiology. But before coming directly to this part of the paper, a few remarks on the reflex nervous system are in order.

In general, it may be said that reflex pain is the result of either mechanical or chemical irritation of the sensory nerve endings connected with the sympathetic ganglia and thence referred to the peripheral system, or that reflex pain is due to direct irritation of the peripheral sensory nerve endings, or of the sensory roots of the spinal cord, whence the pain is referred along the ramifications of these roots. It may also be stated, in a general way, that chronic pain is more apt to be due to mechanical irritation than to chemical, *i. e.*, toxic and bacterial influences, and even in the latter case, to mechanical restriction upon the inflamed nerve.

Let us consider a few examples of the reflex mechanism of pain or hyperesthesia or paresthesia:

The gastric crises of tabes are the result of irritation of the posterior nerve roots of the 6th, 7th, 8th, and 9th dorsal segments, and are probably due to a localized low-grade meningitis around these roots. The same mechanism may be responsible for intestinal, laryngeal, ocular, bladder, renal, and even sebaceous and sweat gland and vascular crises. The pain in the epigastrium which accompanies vertebral caries is likewise due to the mechanical irritation of the posterior roots of the 7th, 8th and 9th segments from the pressure of granulomatous products of the disease.

In connection with the whole subject of root pain, it is important to note the fact that the outer layer of the dura is alone sensitive. (See work of Elsberg on Spinal Surgery.)

According to Mackenzie, the sensory reflex of every organ is accompanied by a motor and a visceral reflex. It has been determined, also, that the sensation of pain relative to viscera has the following characteristics:

1. Splanchnic pain is usually in the midline, even if the organ by which it is caused lies on one side, or partly so.
2. Contrary to the pain of the peripheral hyperesthetic zones, splanchnic pain is not relieved by moderate chloroform narcosis.
3. The radiating external pains are never clearly defined.
4. The radiating external pains are felt in deeper structures (muscles, breast) and not in the superficial layers of the skin. (As is true of root irritation.)
5. Artificial stimuli, such as alcohol, cantharides, mustard plaster, the galvanic or faradic currents and hot applications, prevent, temporarily, the passage of visceral stimuli through the spinal roots to the peripheral hyperalgesic zones.
6. Both types of pain, visceral and radiating, are increased by intense emotion, such as fear and anger. (Higier).

On the other hand, chronic reflex pain may be due to peripheral causes, such as bad posture, weak feet, and have nothing to do with direct irritation of the posterior roots or with visceral disease, being dependent on a lack of equilibration of weight-bearing, and hence muscle strain, or to irritation of the synovial nerve of the joint being strained, and hence reflex pain to the other nerves connected with the articular branch. It is only of recent years that the frequency of mechanical conditions, such as bad posture, as causes of reflex pain, began to be appreciated; the work of Goldthwait especially has shown us their significance in relation to healthy visceral function.

We come now to the detailed consideration of types of persistent pain or other nerve symptoms in relation to causation.

A. *Cranial Nerves.*

1. *Gummatous infiltrations* of the cranial bones may be responsible for radiating headache; the lesion generally begins as an osteoperiostitis, and may directly involve the facial, auditory and abducens, as well as the trigeminal. Similar symptoms may be due to metastatic carcinoma or to exostoses following the fractures of cranial bones.

2. A frequent cause of headache and of neuralgic pain in the face is *cerebral lues* of the meningeal type. This is frequently overlooked because of failure to make or have made a careful and thorough neurological examination. (Migraine may turn out to be cerebral syphilis.)

3. *Sinusitis* is another frequent condition causing chronic headache.

4. *Brain tumor* is, of course, always to be considered.

5. *Psychic disturbances*, temporary or prolonged, are responsible for headaches, and the psychic disturbance which accompanies grief, fear and anger may aggravate the pain of other causation or bring on its acute phase. But the pain of psychic origin is rarely prolonged or

continuous unless due to the mental impression of physical injury when it simulates pain of organic cause, or when fatigue of the nervous centers is very far advanced, as in extreme neurasthenia.

6. *Arthritis* of the upper cervical vertebrae is not to be despised as a cause of frequent attacks of more or less acute pain radiating along the great occipital nerve throughout its course, or confined to the base of the occiput, where the patient often declares that he has a feeling of great pressure, which he fears is the forerunner of apoplexy or insanity. A stiff neck is not necessarily associated at any time or often with this type of pain; but crepitations in the joints of the neck and elsewhere are frequently observed.

B. Cervico-Brachial Nerves.

1. *Arthritis*, again, is the cause which would first come to mind. Together with the arthritis there may be an inflammatory neuritis, but it is the writer's belief that in the majority of instances the arthritis precedes and provides the mechanical conditions favoring a neuritis, which may be then brought on by trauma of slight degree or by cold. Both the arthritis and the neuritis are, in the last analysis, due to the same cause, *i. e.*, focal infection from teeth, tonsils or other localities. A chronic arthritis generally precedes by years or months the onset of the neuritis, and if the former were treated by measures to secure surgical rest and immobilization of the inflamed joint during the early stages, neuritis would not develop, in all probability. The arthritis may exist either in the shoulder or the cervical joints, in both of which regions an arthritis is predisposed to because of the repeated traumata to which these joints are exposed, and in the case of the cervical spine by faulty posture, especially in people of sedentary occupations. Therefore, efforts to correct or prevent faulty posture serve to prevent arthritis of the cervical spine; this is true of any of the weight-bearing joints of the body, *e.g.*, the knee, foot, sacro-iliac and lumbar joints.

In connection with pain about the shoulder or down the upper arm, a subdeltoid or subacromial bursitis should not be forgotten in making a differential diagnosis.

2. *Pott's disease* of the cervical spine here comes into consideration. Many a patient has been allowed to jeopardize his chances of cure, as well as to suffer needlessly, because a diagnosis was made without a careful examination for muscle spasm in the neck, and without any x-ray of the cervical vertebrae, or if one was taken only the anterior view was made and no lateral view. The clinical signs of tubercular caries are very definite even before the x-ray reveals the disease; the diagnosis should be made on them alone even if the roentgenogram is negative.

3. *Spinal Cord Tumor:* Although this condition is not nearly so common as those above mentioned, it is one that should always be borne in mind when confronted with persistent pain referred to the brachial nerves, especially if this pain is progressive and of only a few weeks' duration. A careful examination for sensory changes, however slight, in sharply defined areas of the skin, and periodic examinations every few days, are very essential in making such a diagnosis. In cord tumor there is usually a change in the objective symptoms from week to week; thus severe pain may be followed by numbness or other paresthesiae, by localized analgesia or thermoalgesia, with muscular weakness of an arm and a spastic or stumbling gait. All these symptoms could be elicited before the case came to the inoperable stage if the attendant had the habit of making a careful neurological examination or of having one made.

4. *Diaphragmatic pleurisy* may also cause brachial pain because of the connection of the phrenic nerve with the fourth and fifth cervical nerves.

5. *Aneurysm of the subclavian* is also to be held in mind in reference to brachial pain, when persistent.

C. Lumbar-Sacral Plexus:

Pain in these nerves is probably more often misunderstood than is pain in any other region, because of the complex ramifications of these nerves.

1. *Tabes:* If all the instances in which laparotomy has been performed for the pains of tabetic crises were recorded, the evidence would be astounding. But the most astonishing feature of such an inquiry would be the fact of failure on the part of the attending physician and the surgeon to have thorough neurological examinations made when case is first seen.

2. *Syphilitic meningitis* of the lumbar cord is frequently diagnosed as rheumatism or neuritis, or as sacro-iliac strain, because no neurological tests, including the examination of the spinal fluid, have been made. For example, a man forty-five years of age gave a history of a severe fall followed by persistent backache and pain radiating down both sciatic nerves, with coldness and numbness along the outer side of the legs. Because of the history of a fall, and because of the pain being aggravated by forward flexion of the spine, he was put into a plaster jacket. He obtained no relief after several days, and later developed more difficulty in walking, with spasticity and ankle clonus. Finally a lumbar puncture was made and positive Wassermann and globulin tests found in the fluid. Up to this time the pupils had not appeared abnormal. Later, the patient developed signs of fulminating general paresis, and within a year from the time he was first seen he had to be committed to an asylum because of attempting to kill his wife.

3. *Tumors of the Spinal Cord*: These are especially difficult to differentiate early from arthritis of the spine, and if the tumor is of

the cauda equina a diagnosis of sciatica is often made and adhered to until too late. Root pains are present in all these disorders and are the first symptoms, but a careful sensory examination will usually reveal early some degree of anesthesia or hyperesthesia of the root type, combined with hyperesthetic areas above and below, when tumor is present. The diagnosis of caudal tumors is particularly difficult because of the few neurological signs, neuralgic pain being the most prominent and of the same type as that of sciatica, and the sensory changes being confined to a very small area supplied by the fourth and fifth sacral segments, or perhaps only the area supplied by the fifth, near the anus. Furthermore, bladder signs and noticeable paresis of the limbs are absent in caudal tumors in the earlier stages, and patellar reflexes may be unchanged for some time. Tenderness of the spine on percussion over a particular ventebra is a valuable sign in cord tumor, but may also be present in arthritis; an increase in the patellar reflexes may occur in either condition, but the change in the character of the tendon reflexes will progress in cases of spinal cord lesion; the x-ray is of very little help in distinguishing arthritis from tumor because, unless the arthritis is advanced enough to cause hypertrophic changes in the bone, the roentgenogram will be negative.

4. *Aneurysm of the abdominal aorta,* kidney stone, pelvic inflammation or uterine displacement have all to be considered in diagnosing the cause of frequent and persistent pain in the lumbar-sacral plexus. But uterine displacement is not the sole cause, and of less importance than the general postural defects which are associated.

5. *Sacro-iliac strain,* or luxation and lumbosacral strain, either from trauma or bad posture, are frequent and perhaps the most frequent causes of chronic pain of the lower back and the sciatic distribution. Such conditions may also produce coldness and numbness of the thighs, and thus give rise to the suggestion of beginning tabes. Sacro-iliac strain causes pain in the great sciatic distribution, whereas lumbosacral strain causes pain in the groin, ilio-inguinal and ilio-hypogastric regions, and thus may simulate chronic appendicitis. The sacro-iliac joint is supplied by the first and second sacral nerves, and when this joint is strained the terminal branches of the synovial nerves are irritated, and thus the pain is referred along the distribution of the first and second sacral nerves peripherally, *i. e.*, to the sciatic; or the plexus and its blood vessels may be pulled upon, stretched or lacerated. Weakness of the legs may be complained of in sacro-iliac strain, also increased tendon reflexes may be found; but if these two signs increase in degree, and ankle clonus occurs, a cord tumor, subdural hemorrhage or a meningitis is present. A lumbar puncture or immobilization of the spine in plaster will serve to settle the diagnosis.

6. *Flat Feet or Weak Feet*: These can produce chronic lumbo-sacral pain because in such conditions there is an extra amount of strain put upon the lumbar and thigh muscles in preserving equilibrium and in walking, and muscle fatigue results. The same is true of arthritis of the foot.

8. *Postural Defects and Visceroptosis:* This is a comparatively new chapter in medicine, but the opinions of Goldthwait and other orthopedic men have been amply confirmed. Too many women and men also have been quickly relieved of long-standing backache and vague abdominal pain and digestive disorder with chronic constipation by simple mechanical appliances to support the abdominal walls and the lower spine and by exercise, to improve muscular tone and posture, to allow of any scepticism as to the value of these procedures or the significance of posture. Faulty bodily mechanics goes hand in hand with faulty physiological function and has a direct relation to many of the complaints of the chronic invalid. Many an appendix has been unnecessarily removed, and many an abdomen explored because these mechanical factors have not been appreciated. It is true that in this class of patients there is frequently a constitutional neurasthenic and psycho-neurotic state, and the correction of postural defects is not the whole story, but such correction is a very great help in overcoming the neurotic element because it lessens fatigue and adds to efficiency, and thus gives encouragement in the struggle of life.

TREATMENT OF THE VISCEROPTOTIC.

By Richard F. Chase, M.D., Portland, Me.

In another paper,[1] which was based on an observation of 400 consecutive female patients, with reference to visceral ptosis, I have shown that gastroptosis of one inch or more below the navel occurs in about 10% of women, whereas gastroptosis of all degrees (slight and marked) has been observed in from 35 to 50%. With prolapse of the stomach there is always corresponding prolapse of the transverse colon.

From my own and other observations (especially those of roentgenologists) I am led to diagnose gastric prolapse only when the greater curvature of the stomach is found at least one inch below the navel, the lesser curvature being, of course, correspondingly low. Even then, or in case of a prolapsed kidney, I do not always inform the patient of the condition, because I believe that oftentimes such information may be the starting-point of even grave nervous symptoms.

Of the 43 cases of gastroptosis observed in the 400 women I found digestive symptoms in 21%; backache and abdominal dragging, respectively, in 18 and 24%; nervous symptoms in 20%; organic disease, outside of the alimentary tract, in 19%; and constipation in 68%. 73% had lost an average of 13 lbs. in weight.

One of the principal objects of this observation was to determine in what percentage of these severer cases of gastroptosis, treatment of the ptosis itself, or symptoms arising therefrom, seemed indicated. My conclusion was that such treatment is indicated in less than 25% of such cases, because less than that percentage of these patients have symptoms referable to the ptosis. This conclusion, I am aware, is not in accord with the popular view, which seems to be that all patients having one or more prolapsed organs (regardless of the degree) should, necessarily, be treated for that condition. As a matter of fact, all internists realize that many patients having ptosis require no treatment for the affection, because it often gives rise to no symptoms. This is a fact which should be more generally appreciated.

Since the early recognition of visceral ptosis, most of these cases have been cared for by the medical man. You may have noticed of late that much of the literature on this subject has been contributed by surgeons and orthopedists. So much literature, indeed, has emanated from these sources, that I greatly fear the present and past accomplishments of physicians in this line of work may have become obscured. Let us, if you please, consider for a moment what the real facts in the case are. A careful review of the more recent literature on the treatment of ptosis, contributed by our best surgeons, plainly shows that among them there prevails a consensus of opinion regarding surgical treatment. This opinion has been so clearly, if somewhat emphatically, expressed by Dr. J. E. Moore[2] of Minneapolis that I feel I cannot better present it to you than by quoting what he says:

"Many years ago Glenard enlightened the profession concerning visceroptosis, but the average physician paid very little attention to the subject. With the development of abdominal surgery, surgeons began to take note of these physical defects, and very naturally concluded that these defects were the cause of the patients' suffering, and that the best means of treatment would be mechanical. It is necessary in surgery, as in everything else, to go to extremes to find what the happy medium is. These operations did only temporary good and, on the whole, were very disappointing, but they did not kill people; and while they were rather hard on the present generation, they have enabled us to demonstrate that operations are not curative in these conditions, and we have relegated these patients to the physician, where they rightfully belong, and have very materially helped the physician to establish the ground on which he now stands. In this way these operations, now discredited alike by surgeons and physicians, will prove of untold value to future generations. These scars should not be placed to the discredit of the surgeon, but should be looked upon as milestones of his progress, for, having demonstrated the inefficiency of surgery, he honestly turns these patients over to the physician. Real surgeons no longer perform these operations. It is only the 'would-be' surgeon, the one without personal experience, or the honesty or ability to profit by the experience of others. Our worst difficulty now is that half-baked physicians are still referring these cases to us for operation."

So much for surgery. As to the orthopedist, he has, undoubtedly, contributed to our knowledge regarding the effect of bad posture on visceral prolapse, and he has very probably fully emphasized the importance of this feature of the subject, and the general physician has profited thereby. Thus it would seem that visceroptosis is not generally to be considered as a surgical condition; that the orthopedist's chief claim to treatment rests mainly on the correction of bad posture, a condition which in most cases the medical man should be able to care for; and, finally, that visceroptotics generally should be cared for, as in the past, by the medical man. With this premise, let us proceed to the medical treatment of the visceroptotic, that large class of individuals, mostly women, who often present an endless variety of symptoms, and in whom there is found prolapse of one or more of the abdominal organs. Of these patients, it is well to bear in mind that there are two quite distinct types, when classed as to the origin of the condition, viz: (1) the congenital or "virginal" type, as termed by Rovsing, and (2) the acquired type.

Prophylaxis. In most of the acquired and in many of the congenital types the degree of ptosis and the condition, as a whole, might have been ameliorated, had suitable measures been taken in these cases, in the beginning of the condition. Such measures are: (1) avoidance of too frequent pregnancies, (2) proper care of the patient after confinement, (3) the cure of existing constipation, (4) advice and measures to obtain good posture, (5) the proper use of corsets, if they are to be worn, (6) the avoidance of overwork, worry, and too strenuous social duties, and (7) advice as to general exercise, hygiene, etc.

As a rule, it is the family physician who first has the privilege of prescribing these measures, for it is he who first comes in contact with these patients. And let me state here, that in no other line of his work is there greater opportunity to benefit womankind and, indirectly, mankind as a whole.

Of the severer cases of visceral ptosis, I am sure we have all been impressed with the generally "run-down and played-out" condition of the patients, both physically and mentally. Rest, then, both physical and mental, is one of the very first requisites of treatment, and it should be prescribed according to the needs of the individual case. Physical rest may vary in amounts from 30 to 60 minutes on a couch after each meal (when the stomach contains its greatest weight), to complete rest in bed from one to several weeks. With the patient in the horizontal position, it has been shown by the x-rays that motile prolapsed organs return nearly, if not quite, to their normal position, while if the foot of the couch or bed used is elevated 10 inches or more, the return of such organs to normal position, and the consequent relaxation of their ligaments, is assured. This is a simple and beneficial measure, too often neglected.

If the necessary mental rest cannot be obtained at home, as is often the case, then the patient should be removed to some place where such rest may be procured. For the neurasthenic type such a step is often necessary.

Weight. In practically all cases of marked degrees of ptosis the patients are poorly nourished, and in all severe cases of acquired ptosis there is some loss of weight. Loss of weight is believed by many to be one of the chief causative factors of visceral ptosis. In any event, to effect a cure of the ptosis and the patient, the weight must be restored in whole or part. This restoration of weight must be procured through food which, of course, must undergo proper metabolism. Proper metabolism, however, cannot take place if, as often happens, some derangement of the digestive system exists, no matter whether the derangement is of functional or organic origin.

The nature of the trouble must be determined by the usual measures employed in the diagnosis of digestive diseases. The ascertainment of the digestive condition not only directs, to a considerable extent, the proper drug and dietetic treatment, but it further aids in the cure of some patients by the assurance, if such is the case, that no imaginary serious condition exists.

The digestive disturbance known, and relieved or overcome, the question of diet and nutrition becomes a simple one, whereas blind attempts to increase nutrition are often failures. In the beginning of treatment the diet is dependent largely on the existing digestive condition, later the chief question is how much food to use. This question may be settled either by weighing the food and calculating the number of calories represented, or by weighing the patient. Personally I prefer and employ the latter method, even though the patient is confined to bed. A sufficient increase in the patient's weight is the surest proof that the amount of food consumed is sufficient, even though the quantity may seem to both physician and patient to be insufficient. The demonstration to the patient of an increase of weight usually has a favorable psychic effect, as it convinces her that you are accomplishing something, and she will naturally believe that you can do yet more.

The various phobias and whims of the patient regarding diet must be overcome. By proper tests of the stomach you must prove to her that your knowledge of her digestive functions is pretty exact, and that her digestive organs are capable of taking care of the quality and quantity of food which you prescribe. But remember that "in the long-run" such accomplishments are not obtained through bluff; you must, as a rule, deliver the goods.

Constipation, as stated, occurred in 68% of the cases observed. This condition is not only very common in this class of patients, but its severity is hardly equalled by any other class. I wish to state emphatically that most cases of constipation are curable, and by medical measures; and I mean by this that after such treatment, patients may have regular movements of the bowels, and without the aid of drugs, enemata or other like measures. The general physician pays too little attention to this condition. As a rule, his treatment is careless, inefficient and consequently not curative. I cannot here enter into the finer details of treatment. Determine if the constipation is of the atonic or spastic type, and the cause, if possible. Then secure for the patient a regular movement of the bowels, perhaps with cascara if of the atonic type, or with belladonna or hyoscyamus if of the spastic type, in conjunction with diet and other measures, gradually reducing the dosage of medicine until none is required. Regularity of habit *must* be obtained by the above means, the Leube oil treatment, or by other measures.

Diet is the main feature of this treatment, and a correct diet must be employed *both* during and after the cure. The quality and quantity of food must be definitely prescribed and the physician *must see to it* that such diet is used; this necessitates at least weekly visits to the physician.

Diet in constipation becomes a simple matter if one recalls that food acts favorably on the intestines in three ways: (1) by its mechanical effect, stimulating peristalsis; (2) by its sugar content, stimulating intestinal secretion; and (3) by its acid content, also stimulating peristalsis. Some foods, of course, act favorably through all three of these agencies. A sufficient variety of food can and should be prescribed, provided no contraindications exist, such as diabetes, certain stomach disorders, etc. Special trunk and general exercises must be insisted upon in some cases, if the general condition of the patient permits; but *do not* make the mistake of urging exercise for these patients when it is rest that is first needed.

After the time for exercise has arrived, I often have the patient wear a pedometer, at first, to guard against too much walking. later to learn if she walks enough.

Special trunk exercises should be taught the patient; they are beneficial to both the constipation and the ptosis, to the latter by strengthening the abdominal muscles, and also by improving the posture. Hydrotherapy, massage, and electricity may be desirable in some cases; they are usually not essential. Severe cases of constipation are rarely or never cured by drug treatment alone. In the proper treatment of this condition, perseverance must be insisted upon and often stimulated by the physician.

I cannot here discuss spastic constipation, often accompanied by colitis, or other bowel conditions; suffice it to say that they, like *all other* complicating affections, must receive their proper attention.

I fear that already the various measures recommended may, to some, seem elaborate, even impractical, but I assure you if one does not employ these or other equally beneficial measures he will continue to lose this class as patients.

Remember always that in the care of these cases, it is the patient and her entire condition, not alone the ptosis, that you must treat. Abdominal support, to many physicians, appears to be the "cure all" for these patients, and it seems to matter little whether the supporter supports or not. That the benefits derived from some supporters is purely mental, cannot be doubted. If a patient's abdomen is flat or concave, support of the abdominal viscera cannot be obtained, even if the graduated pads are used. For cases in which support may be obtained, I occasionally employ the Storm binder, especially for men. For most women, if they wear corsets, and if support is obtainable, I obtain it through a suitable corset, properly fitted and properly worn. Such a corset not only furnishes support, in certain cases, but it also aids in correcting bad posture; it compels a woman to sit and stand properly. Several of the worst cases of ptosis that I have encountered in private practice have been cured without the aid of an abdominal supporter or a corset, consequently I feel that such support is not really essential to a cure, in some cases.

By the term "cure," I mean the overcoming of all curable symptoms, and the securing of a partial return of the prolapsed organs to their normal positions. Rarely or never are prolapsed viscera completely restored to their normal position, and such restoration is evidently not essential to a cure. Through abdominal support and a general increase in the patient's strength, abdominal dragging and backache (met in about one-fifth of these patients), when due to ptosis, usually disappear.

Simple prolapse of the kidney, as a rule, causes no symptoms, and consequently requires no particular attention; but if it seems desirable to furnish support for the kidney, such support may be obtained by the methods mentioned, in so far as support is obtainable.

The nervous or mental element presented by some of these patients is often the most difficult feature of the whole condition to overcome. Some men seem to attribute these symptoms to the ptosis, and believe that by overcoming the ptosis, the symptoms will disappear. But that such is not the case is proven by surgery, because even successful gastropexies and nephropexies often fail to relieve these symptoms. Like many others, I look upon the ptosis merely as a part of the generally debilitated condition of these patients, and I feel that the ptosis is quite as often the result, as the cause, of a general condition. Consequently, I meet the nervous symptoms in precisely the same way as I would meet nervous symptoms in patients not having ptosis.

My first object in treatment is to relieve the patient of her physical ills, by the methods already set forth. If I am successful, I have gained the patient's confidence, an essential to successful treatment. Her mental ills, her whims, and her phobias, I next endeavor to set right. For example, many patients have erroneous ideas regarding diet and digestion. I show and prove to the patient wherein she is mistaken, not by mere say so, but by convincing acts and facts. The same principle is employed in treating her other erroneous ideas.

Occasionally a case is met in which it is difficult or even impossible to overcome this nervous element; on the other hand, the successful treatment, obtainable in most cases, is a gratifying accomplishment.

A complete consideration of the treatment of the visceroptotic would require a paper much longer than this one, so that I am content if I have succeeded only in presenting for your consideration the following points:

1. That visceral ptosis, of sufficient degree to be of clinical significance, is not as common as generally believed.

2. That surgery is rarely required in the treatment of this condition.

3. That constipation is curable, and by medical means.

4. That abdominal support, although desirable, cannot be obtained in some cases.

5. That the treatment of these cases must be directed to all of the patient's physical and mental ills, and that the ptosis is often a secondary consideration, but which in the mind of the patient has become of considerable importance merely from the knowledge of the fact that such a condition exists.

REFERENCES

[1] Visceral Ptosis, Maine Medical Journal, April, 1915

[2] Moore, J. E.: Discussion, Jour. A. M. A., Nov. 18, 1911.

RELATIONS OF PRENATAL AND POSTNATAL WORK.

By Michael M. Davis, Jr., Ph.D., Boston,

Director of the Boston Dispensary.

Germany, in October, 1914, at the outbreak of her war, appropriated the sum of two million marks *a month* for use in aiding women at the time of maternity; this being in addition to an already well-developed system of maternity benefits. Such a sum, calculated on a per capita basis, would mean $60,000 a year in the city of Boston,—a larger amount than is now expended for the prenatal and postnatal services of the Boston Department of Health, the Instructive District Nursing Association, and the Baby Hygiene Association, all put together. If Germany deemed such a sum well spent in conjunction with a war undertaken for her purposes, what amount may our nation think wise to put forth, with the aim of protecting the future citizens of "a world made safe for democracy"?

Undoubtedly, the expenditure of public and private funds for the welfare of babies and mothers will depend on our realization of a need and on our confidence that the mode of its expenditure is wise. On the latter question, that of method, the data published in The Boston Medical and Surgical Journal of January 4, 1917, had some bearing. The information collected in the present paper leads on from that point.

The conclusions of the article just mentioned, as to the benefits of prenatal work, were summarized as follows:—

> "1. A comparison of the death-rates of 731 babies whose mothers received prenatal care in five wards of the city of Boston during the two years 1914 and 1915, shows that the death-rates were reduced to one-half or one-third those found among babies not receiving prenatal care in these wards during the same period.
>
> 2. This reduction is found among babies during the first week of life, during the first month of life, and during the first year of life, taken as a whole.
>
> 3. The proportion of still-births, in each year, is only half that among the general population.
>
> 4. As it is known that only a small proportion of these babies received any other organized medical or nursing supervision, the reduction in death rate is apparently to be attributed to the prenatal work."

Since the publication of this paper valuable confirmation has arisen from New York. In the Bulletin of the Department of Health of New York City for February 24, 1917, is printed a report of the prenatal work during 1914, 1915 and 1916. Comparison of the death-rate among the prenatal cases with the general death-rate among babies in New York showed a marked reduction, and this, as the following table indicates, parallels closely our Boston data.

Table I. Comparison of the Death-Rates among Prenatal Cases with the Death-Rate among General Cases of Babies in the City of New York and in Five Wards of Boston during the Years 1914 and 1915.

	Death-Rate of Prenatal Cases under One Month of Age		Death-Rate of General Cases of Babies of the Same Age Period	
	Boston	New York	Boston	New York
1914	17.3	19.5	45.3	36.6
1915	25.9	26.0	38.3	35.9

It is certainly noteworthy that the death-rate of babies under one month of age, who received prenatal care, is practically identical in both Boston and in New York during these two years.

It is no less striking that the *reduction* in the death-rate under one month of age, produced on account of, or in conjunction with, the prenatal work, is closely similar in the two cities. In 1914 the prenatal cases show a death-rate (under one month of age) of 38% of the general cases in Boston, and of 53% of the general cases in New York. In 1915 the corresponding figures are much closer, being 67.6% and 72.4%, respectively.

In the authoritative address of Dr. J. Whitridge Williams, printed in the *Journal of the American Medical Association* of January 9, 1915, it was estimated that the application of prenatal and obstetrical care, according to the standards outlined by Dr. Williams, would have been capable of reducing the mortality to 59% of that which actually occurred without the prenatal care. Dr. Williams' mortality rate was taken to include all deaths from the seventh month of pregnancy up to two weeks after delivery, and his estimate is not, therefore, strictly comparable with the Boston or New York figures. It is, however, worth noting that the average reduction in death-rate up to one month of age, as shown by the above figures in Boston and New York during 1914 and 1915, was 58%.

On the basis of the data secured in Boston and New York and of Dr. Williams' estimate, it seems conservative for us to estimate that well-organized prenatal work may be expected to reduce the mortality of babies under one month of age by 33% under what would occur without such service, and of babies up to one year of age by fully 40%.

There can be no doubt that the reduction in the death-rate is not only due to the nursing care and advice given to the mother and family during the period of pregnancy, but also to the improvement in obstetrical and post partum care, which is a direct or an indirect result of the attention of the nurse. In this respect a distinct contrast appears between the two cities. In New York, 64% of 898 prenatal cases were delivered by midwives in 1914, and 61.9% of 1442 cases in 1915. In Boston practically no cases were delivered by midwives, the majority (60%) of the mothers being attended by the out-patient service of the Boston Lying-in Hospital. In New York, in 1914, 8½% of the cases were delivered in hospitals (7.4% in 1915) while in Boston the hospital deliveries were under 4%. This marked divergence in the obstetrical service is not, however, accompanied by any noticeable difference in the death-rate of the babies during the first month of life.

EFFECT OF PRENATAL WORK ON BABIES OVER ONE MONTH OLD.

Since the publication of the paper in The Boston Medical and Surgical Journal last January, there has been time to make a further study of the 1915 prenatal cases. Inasmuch as every one of the babies who had received prenatal care was followed through to the end of its first year of life, the study of all the babies born in 1915 could not be completed until after the close of 1916. All deaths occurring among these babies during 1916 have been tabulated, the age, cause of death, etc., being recorded. A similar study had previously been conducted for the babies receiving prenatal care in the same five wards of Boston during 1914.

We are thus able to state for these two years the number of deaths which occurred between the ages of one month and one year, among the 731 babies who had received prenatal care. The following figures were secured in this way, and in the next table are compared with the death-rate during the same age period of all the other babies in the same five wards who did not receive prenatal care.

Table II. Death-Rate of Babies Who Had Received Prenatal Care in Five Wards of Boston during 1914 and 1915. Ages: One Month to One Year.

COMPARISON WITH CORRESPONDING BABIES WHO HAD NOT RECEIVED PRENATAL CARE.

Prenatal Cases. Death-Rate per 1000 Living Births.		Non-Prenatal Cases in Same Wards		Per Cent. Reduction
	Death-Rate		Death-Rate	
1914	20.2	1914	62.8	68%
1915	33.2	1915	58.3	42%

This table shows that between the ages of one and twelve months the death-rate among the prenatal cases was far less than among those not receiving prenatal care. The reduction was 68% in 1914 and 42% in 1915. This certainly tends to indicate that the effect of the prenatal work is substantial, even after the close of the first month of life.

The prenatal work as conducted by the nurses of the Instructive District Nursing Association of Boston does not continue beyond two weeks after the birth of the child. Whatever effect is produced by the prenatal work upon the health of the child between the first and twelfth month of life must, therefore, be due: (1) to giving the child a better physical start; (2) to educating the mother in the care of her baby; and (3) to the promotion of breast feeding. No data exist for determining the relative importance of these three factors.

To what extent did these prenatal cases between the ages of one month and one year receive other organized medical and nursing service? The chief form of such service in Boston is that furnished by the Baby Hygiene Association, with its "milk stations," its conferences for mothers and babies, and its trained corps of visiting nurses. These nurses are not the same as those of the District Nursing Association who carry on the prenatal work. Most cases (two-thirds of the 731 cases studied) were referred by the district nurses to the Baby Hygiene Association, but only 17 or 18% actually went to the Baby Hygiene Station (17% in 1914, 18% in 1915).[*] Thus over four-fifths of the prenatal cases did not receive this medical supervision between the ages of one month and one year, and the lowered death-rate shown in Table No. II must be attributed mainly to the prenatal work.

RELATIONS BETWEEN PRENATAL AND POSTNATAL WORK.

Prenatal work kills two birds with one stone. It benefits the mother and the baby also, and shows such results for both that it should be regarded as the basis of the campaign against infant mortality. Historically, the development of the infant welfare campaign in this country began with the baby, often merely with providing pure milk for babies. It has come to emphasize education more than milk; and is advancing to include obstetrical and prenatal care. Logically, prenatal care is the foundation of the campaign against infant mortality, and as the public comes to appreciate its practical value and far-reaching human significance, prenatal work will assume the place which it should. Its extension is now proceeding. Postnatal work, however, was and still is the psychological point of approach, because a baby has for most people a keen dramatic interest. The emphasis of the infant welfare campaign, however, has shifted, and must further shift, from Milk to Motherhood.

This does not mean that postnatal work should be abandoned, or even diminished. Its well-established forms have demonstrated their value. It does mean that there should be a new emphasis in the infant welfare campaign and some change in relationships between its two chief branches. Surely it would be good for babies and their mothers if a prenatal service, followed in every case by postnatal service, reached every baby and every mother. But is there any community in which resources are yet sufficient even to approximate this ideal? In Boston, for example, about 20,000 babies are born annually. In 1915 the Baby Hygiene Association reached 4792; the prenatal work of the District Nursing Association reached 2536. Allowing for babies reached by both, the total number of individuals reached by these two large agencies for the prevention of infant mortality was about 5900, or less than one-third of the total number of babies in the city. The usual limitation faced by public or private organizations in every city is, of course, lack of money. When the number of cases actually reached is so far below the number who need to be reached, surely a selection must be made. What principles should guide this selection?

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[*] It would be interesting to compare the death-rate of the cases which received both forms of care with those receiving only one. The number of cases is too small to render such a comparison possible.

1. A nurse who has followed mothers and babies up to two weeks after confinement is in an excellent position to select those babies who particularly need postnatal care. Babies who are known to the nurse who gave the prenatal care, as delicate, or likely to be weaned early, should, without fail, be brought over to the postnatal service. The prenatal nurse can be held responsible for this.

2. The routine reference of every prenatal case to the postnatal service is probably not so valuable as the concentration of postnatal work upon the cases selected by the prenatal nurse for a definite reason.

3. The prenatal nurse should be the same as the postnatal, for thus continuous and efficient service will be vastly facilitated. Otherwise the prenatal nurse may be held responsible for the actual transfer to the postnatal nurse of the cases selected.

4. Many babies who have not received prenatal care and who are delicate, bottle-fed, or otherwise needy, require particularly the postnatal service. Some babies who have had the prenatal service, may, before the end of their first year, develop conditions which the postnatal service would benefit.

5. The selection of babies of these classes requires a definite effort to reach them on the part of the postnatal service, partly through publicity and partly through canvass of districts by nurses, or otherwise. Rightly placed effort in selecting or hunting up needy cases is as valuable as effort spent in caring for cases. Until prenatal or postnatal services can be extended to reach the entire population of a district, the splendid slogan of the infant welfare campaign, "Keep Well Babies Well," needs to be supplemented by such war-cries as: "Keep Sickly Babies from Getting Sick"; or "Before You Wean Your Baby, Take Him to a Health Station."

The presence of war lends timeliness to this point. High prices of food are bringing pressure upon families of small means. Adequate food supply comes harder; and in not a few instances is curtailed. Milk seems one of the first articles to be cut down or diminished. With little babies, for whom milk in some form is a necessity, condensed milk or patent food may be substituted more than usually for the seemingly expensive fresh milk. Also, some increase in the employment of women may be expected to occur. Shall we have less breast nursing in consequence of more mothers at work, and of a less adequate food supply for mothers, whether they are at work or not? Shall we face a lessened supply of milk, and the more extended use of substitutes for milk, among the bottle-fed babies? We cannot tell in advance how much these evils will extend or be aggravated by conditions of war-time. We may be reasonably sure that needs and evils of this sort, which have existed in some measure in the past years of peace, will not pass away, but will rather be greater during this period of war, unless special and unusual efforts are made to meet them. Unless the funds available for prenatal and postnatal work can be largely increased so that *all* the mothers and babies who need help can be reached, there should be a *planned selection* of the babies received for postnatal care.

Without doubt the scientific foundation for public health campaigns against infant mortality, tuberculosis and other ills, is the population basis. The total population and also the total number of babies, or other groups affected by the campaign, should be known for each district; the district should be organized with a view to reaching all or as large a proportion of the total as possible; the test constantly applied to the work should be the proportion of cases reached to the total possible cases in the district. Such a plan is now becoming gradually familiar through the development of local health centers in various cities. One of the first steps toward it is reducing the number of different agencies, or more closely coördinating the different agencies which work within a district in related fields, particularly in such closely related fields as prenatal and postnatal work.

When, however, local conditions do not permit of doing infant welfare work on a population basis, or when inadequate funds would compel a few districts only to be covered, then the policy of a carefully planned selection of cases, especially for the postnatal work, should be adopted, as a means of applying effort where it will count for most.

Such a campaign and such conscious selection of cases means a militant rather than a recipient attitude on the part of the organizations doing prenatal or postnatal work with babies. It may mean systematic canvass of districts by nurses. It certainly would be aided by aggressive publicity from a central and authoritative source.

A program for the protection and conservation of infant life must aim to *make it possible for every mother to have prenatal nursing service; for every baby who is delicate or who is bottle-fed, or sickly, to be under the skilled supervision of the doctors and nurses of babies' health stations; for every mother who is nursing a baby to have sufficient food and sufficient milk* *for herself and her child; for every baby who is bottle-fed to have enough and good enough milk at a price which its parents can pay; to enable every mother and father to know where and how these benefits can be obtained at their expense when they can meet it, or free if they cannot.* Such a program is vital to the community in peace-time. In war-time it is the same, only raised to a higher power.

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Book Reviews.

Health and Disease, their Determining Factors. By Roger I. Lee, M.D., Professor of Hygiene in Harvard University; Visiting Physician, Massachusetts General Hospital. Boston: Little, Brown & Co. 1917.

This new work on personal hygiene, preventive medicine and public sanitation may be regarded as the author's first extensive contribution from the foundation whose professorship he holds. It represents essentially a series of lectures before classes in Harvard University and may be regarded as a summary of the author's teaching in his department. It should constitute, therefore, a textbook of definite value to students, but its field of service will be much wider among physicians, public health workers, and the community at large. It is particularly to be commended for the sanity of its general and specific points of view and for its felicity of phraseology and illustration. To those who know him, the author's personality is pleasantly presented in these pages; and to those who do not, the acquaintance with its wholesome and vigorous common sense will prove one of the desirable attractions of this volume.

Clinical Tuberculosis. By Francis Marion Pottenger, M.D. St. Louis: C. V. Mosby Co. 1917.

This work of Dr. Pottenger's consists of two large volumes, each containing over 700 pages. There are nearly 200 illustrations, charts and plates. The two volumes together weigh over seven pounds and would appear somewhat unnecessarily large and cumbersome. Three, or even four, smaller volumes would have been easier to read and handle.

In reviewing such a book as this, one must first know the purpose for which it was written and the place it is intended to fill. As a textbook, or indeed, a book of reference for the general practitioner, it is hardly available. The information sought for is undoubtedly to be found within its covers, but is to be found only with difficulty, while its size and cost would daunt the average busy doctor. As a reference book for specialists, sanatorium men, and others especially interested in this subject, this book will prove of great value on account of its wealth of detail and references to original sources. It has this great difference from a volume to which various men have contributed articles, in that the book is imbued from cover to cover with the personality of the author. His opinion and his alone, is what one gets in regard to any subject. The references to other investigators are largely from German sources; American, English, and French writers are in the minority.

Dr. Pottenger, as stated in his introduction, has approached his subject from the broadest standpoint. "Anatomy and physiology, both normal and pathological, have been made the basis of my studies; and visceral neurology has received unusual attention. I have endeavored to approach the study of tuberculosis from the standpoint of internal medicine in its broadest sense."

Indeed, it is open to question as to whether or not the subject has not been approached from somewhat too broad a point of view. Over sixty-seven pages are devoted to tuberculosis and the nervous system; forty pages to "compensatory changes in the thorax and abdominal cavities resulting from pulmonary tuberculosis"; forty pages to "fever in tuberculosis," and twenty pages to "psychotherapy." One is greatly impressed and somewhat overwhelmed by the tremendous amount of information in these two volumes, and, likewise, one is tempted to ask whether this information would not do more good if it were in briefer form and more available to those who need it most—the general practitioners.

Nevertheless, this work of Dr. Pottenger's is a remarkable one and one that any student in tuberculosis will do well to secure and to study carefully. To attempt to read these two volumes consecutively would be a well-nigh impossible task; to pick out here and there the countless points of interest and value, a delightful one.

Who Is Insane? By Stephen Smith, A.M., M.D., LL.D., New York: The Macmillan Company. 1916.

The author of this volume was commissioner in lunacy of the State of New York from 1882 to 1888, and evidently was much interested in various phases of the problems of mental disease. This book is not a treatise on insanity, or even a scientific treatment of any single phase of the problems, medical or sociological, which are discussed by the writer, but rather a pleasant, rather discursive chat on a variety of these topics, often suggestive, and always pleasantly written.

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SCHOOL OF INSTRUCTION FOR HEALTH OFFICIALS.

As a part of the campaign of the Committee on Public Health of the Massachusetts Medical Society to stimulate the interest of physicians in the public health and to enable them to bear more efficiently the share of responsibility for the prevention of disease for which their training naturally fits them, comes the announcement of the Convocation and School of Instruction for Massachusetts Health Officials. The convocation is to be held in Boston on the 4th, 5th, 6th and 7th of September, directly under the auspices of the Committee on Public Health, but with the endorsement and coöperation of the State Department of Health and the Massachusetts Association of Boards of Health.

The school will be the first of its kind in Massachusetts, although the plan has been favorably considered by the State Department of Health and by the Massachusetts Association of Boards of Health, and has been used with good results in about half of the states in the Union, but especially in New York and Kansas, where the work has reached its highest development. In brief, it consists of a short course of lectures, demonstrations and clinics, taking up the subjects in the field of public health which are most important from the standpoint of local health authorities. The subjects are those in which every progressive practitioner should take an interest, and will be presented in the most elementary and practical form, but in each case by authorities who are fitted to give the most up-to-date information in their particular lines, and who will be ready to answer questions which may be asked by those who attend the lecture. The Committee appreciates the fact that it is hard for practising physicians to get away, and so has arranged the course with a view to cramming the greatest possible amount of valuable and practical information into a short time, and no time will be spent in receptions, addresses of welcome, or other formalities.

The program is not wholly completed as this number of the JOURNAL goes to press, and, in consequence, cannot be printed here, but advance copies will be mailed to all boards of health in the state, and as far as possible, to all school physicians. Among the features already settled are: a symposium on The Board of Health Laboratory in Towns and Small Cities, to be held on Tuesday afternoon at the laboratory in the town of Arlington; a clinic and discussion of the Diagnosis and Treatment of the Common Contagious Diseases, to be conducted by Dr. Edwin H. Place on Thursday morning at the South Department of the Boston City Hospital; a discussion and clinical demonstration of Minimum Diagnostic Standards for Tuberculosis, Friday morning by Dr. John B. Hawes, 2d, at the Massachusetts General Hospital; and a symposium for school physicians at the Evans Memorial Hall on Thursday afternoon.

The course is free to all members and employees of Boards of Health, whether medical or lay; to school physicians; and to all other physicians who are interested. Owing to the necessity of making especial efforts to conserve the health of the civil population during the war, it is hoped that all who can come will do so. Over 400 preliminary notices were sent out to physicians in the Commonwealth, and up to the time this article was written, about seventy per cent of the replies received indicated that the writer expected to attend all or part of the lectures, while twenty per cent. additional said they would come if their municipality would pay their expenses. Since the salaries for municipal service are small and the expense of attending are rather large, even if the loss of time be disregarded, the Governor has issued an appeal to the Mayor or Board of Selectmen of every city or town to pay the expenses of one or more representatives to the convocation. Where this is not possible, it is hoped that the Board of Health may pay the expenses of a representative.

THE SPHERE OF SOCIAL MEDICINE.

No better illustration can be had of the need of attention to the patient, and the possibilities for functional and social reconstruction beyond his discharge from medical or surgical care, than by the excellent work done in Europe in this regard. The question of bringing the wounded and crippled soldier back to life, of training him to useful occupation, has well nigh been solved. At any rate, it has opened a new field in constructive medicine. It is not sufficient to cure or to heal a wounded member of the body unless that member of the body can be restored to usefulness. Any treatment that is undertaken must be undertaken with an eye to its usefulness subsequent to discharge, otherwise the member might better not be saved. The same idea, in a larger way, may be applied to the individual as a whole. It is not enough to cure disease or to alleviate symptoms unless the case is followed up so as to prevent the recurrence of the social conditions at the bottom of so many diseases, and to determine for the individual suitable occupation, which he can do despite any remaining defect, and which is not inimical to his physical or mental constitution. Vocational guidance for the young is an easier problem than vocational guidance for the handicapped, but in the latter is more necessary in order to relieve society of a burden and to make productive those who would otherwise be parasites.

Most institutions have established social service departments. It is for them to prevent returns to the institutions by helping the former patients to rehabilitate themselves. Through them a better understanding of the home and social environment can be had, so necessary in progressive therapeutics. In mental diseases it is now well recognized that the etiological conditions—the psychogenic or social causes—are very largely environmental. Relapses can very largely be prevented by careful follow-up work after discharge, with a view to remedying those environmental conditions which act as psychogenic factors in the causation of mental disturbances. The social medical worker can obtain history as can no one else, and he can act as interpreter of the conditions to the medical attendant, so that less reliance need be placed upon the usually unreliable history given by patients or friends. On the other hand, the social medical worker can interpret to the patient the significance of his condition, so that the natural desire of the patient to know what ails him can be satisfied, and his better coöperation thereby obtained. The human being is a reasoning creature, and is entitled to know the reasons and the wherefores, whenever they can be supplied.

In a far broader sense the sphere of social medicine and of the social medical worker lies in the study of social, industrial and environmental conditions and their relation to disease, and the formulation of such legislation as will lead to the betterment of the people in general in so far as life, health, and usefulness are concerned.

DENTAL INFECTIONS.

In line with the better understanding of the part played by the teeth in the general health, and in the causation of many of the acute and chronic disease conditions, there has grown up, unfortunately, in the popular mind at least, and in the professional as well, a great deal of misapprehension as to the origin and the significance of the dental and peridental infections. This misunderstanding applies particularly to the so-called pyorrhea. The term "pyorrhea" has come to be applied wrongly to any dental condition, whether due to disease or not. Whenever there is found loss of teeth, dental deposit, or probably some recession of the gum, it is called pyorrhea alveolaris of specific amebic origin. The number of cases of dental infection caused by ameba is, at best, very small when compared to infections from other causes. In any event, the discovery of the ameba is very easily made by intelligent bacteriological examination of all dental infections. Pyorrhea is a symptom—a flowing of pus from the tooth socket, and may be caused by the same organisms as cause infections elsewhere. If the term "pyorrhea" is to be applied at all, it should be applied to inflammations of the tooth joint—to traumatic or septic gingivitis. This infection may be accompanied by detachment of the pericemental fibers. But acute and chronic types of this infection may occur in the dento-alveolar joint as a result of septic emboli and independent of gingival involvement. The infective material may be carried thereto from remote places or from close by—from carious teeth, alveolar process, air passages, tonsil, etc. On the other hand, this dento-alveolar infection, whether of direct or embolic origin, may in turn be the origin, by metastasis, of many acute infections, or even of general septicemia.

Before attempting treatment of purely dental conditions or of diseases elsewhere in the body, of unknown origin, it must be remembered that often bad mouth hygiene, salivary deposits, orthodontic irregularities, imperfect dental work and irritation therefrom, thickened alveolar process, with obstructed and impoverished blood supply, and decayed teeth, are at the bottom of many of them. The amount of pathological change in any case may vary and be out of proportion to the local or general symptoms. The introduction of a dental service in hospitals will serve to clear up many infections of doubtful origin, and will be in keeping with the progress of scientific medicine. As long as there are tangible pathological dental conditions they should be removed before or while instituting other treatment. In such cases it is unscientific to trust to the hypodermic injection of drugs or to vaccines or sera when the clear indications are surgical.

WAR MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

A war meeting will be held at Washington, D. C., Oct. 17-20, 1917, by the American Public Health Association. This will replace the annual meeting, which was to be held at New Orleans, La., Dec. 4-7, 1917.

The papers and conferences will deal largely with the health problems created by the Great War,—the food supply, communicable diseases among soldiers, war and venereal disease, war and the health of the civil population.

President Wilson has said: "It is not an army we must shape and train for war; it is a nation." Go to the Washington meeting; then come back and do your bit!

Washington will be crowded, and those interested are urged to reserve hotel accommodations at once. It will be easy to cancel reservations, but it may be impossible to obtain rooms at the last moment. Any hotel or railroad can give a list of Washington hotels.

Preliminary programs will be automatically mailed to all members of the American Public Health Association about Sept. 15. Non-members may receive them free by writing to

The American Public Health Association,
126 Massachusetts Avenue, Boston.

FIRST AID CLASSES OF THE RED CROSS. INSTRUCTORS WANTED.

The First Aid Division of the Red Cross has sent out copies of the American Red Cross Circular 120, as regards the organization, instruction and examination of first aid classes. Only physicians are called upon to conduct first aid classes of the American Red Cross, and such physicians eventually pass on the proficiency of the candidates for certificates. In order that the Red Cross may appoint qualified physicians to give instructions for these first aid courses, it is desired that as many members of the district medical societies as possible be appointed instructors and examiners. The Bureau of Medical Service of the Red Cross will be glad to furnish applicants with full information describing the work, and will be glad of the assistance of medical men throughout the state. Applications should be made to Major C. H. Connor, Director, The American Red Cross, Washington, D. C.

MEDICAL NOTES.

Tuberculosis Statistics.—The Bureau of the Census is planning to prepare and publish a monograph on the Mortality from Tuberculosis, covering the calendar year 1918. To make this work of greater value, an endeavor is being made to obtain the coöperation of all physicians to the extent of carefully recording or supervising the statements of occupations upon the death certificates during that year. Circular letters to this effect have been sent to all the physicians in the United States.

WAR NOTES.

The Lobar Pneumonia Problem in the Army.—In a recent article in the *New York Medical Journal*, Henry J. Nichols, M.D., Major, Medical Corps, U. S. A., describes an epidemic of lobar pneumonia among the 43,000 men belonging to the mobilization camp at El Paso, Texas. The epidemic began in November, 1916, and extended into April, 1917. It reached its highest point in the last of February after the return of the troops from Mexico. Altogether it embraced over 400 cases, and the mortality was 20%.

Determination of the types of pneumococcus began about the middle of the epidemic, and yielded the following result:

Type	Number	Per Cent.	Per Cent. Mortality for All Kinds of Treatment
I.	84	56%	14.8%
II.	33	22%	30.0%
III.	3	2%	33.0%
IV.	30	20%	13.3%
	150	100%	

Serum treatment was employed with the following results:

Type	Cases Treated with Serum	Died	Per Cent.	Cases Tested without Serum	Died	Per Cent.
I.	63	5	8.0%	18	7	39%
II.	23	5	21.7%	7	4	57%
III.	3	1	33.0%	0	0	0
IV.	24	4	16.6%	6	0	0

Major Nichols believes that a mixed vaccine of Types I and II should be used in large doses in order to give this possibly important measure a fair trial. He concludes his article as follows:

RECOMMENDATIONS.

"If large camps are maintained during the winter months, preparation to handle epidemic pneumonia should be made: 1. By outfitting a base laboratory with personnel and equipment, agglutination sera, mice, etc., for the determination of types of pneumococci in cases, and when possible, in contacts. 2. By supplying the hospital with reliable serum and proper apparatus for treatment. 3. By vaccinating the command with a pneumococcus I and II vaccine, combined, if indicated, with meningococcus vaccine.

SUMMARY.

1. Epidemic lobar pneumonia is to be expected in large camps in the winter months.
2. The disease is principally due to Types I and II.
3. Serum treatment has produced excellent results in reducing mortality.
4. Direct evidence of tent, company, and regimental contagion has been obtained.
5. Vaccination is considered a more promising measure of prevention than isolation."

Exemption of Medical Students.—At a meeting of the Mayor's Committee on Hospital and Medical Facilities, held at City Hall, New York City, on August 15, 1917, the following resolution was unanimously adopted:

Resolved, That the Mayor's Committee on Hospital and Medical Facilities calls the attention of the Secretary of War to the serious consequences to the civilian population of the country, and to the maintenance and operation of the hospitals, of the inclusion of medical students and hospital interns under the act for Selective Service.

Further Resolved, That the Chairman be directed to lay the views of this Committee before the proper officials of the Government and the District Boards of the state of New York, and to take the necessary steps to bring about the temporary exemption of these students and interns in order to secure a constant supply of medical men to the army throughout the war, and to prevent the embarrassment of hospitals, and the consequent serious results to the population of the United States.

The following-named hospitals were represented at the meeting: New York Hospital, Presbyterian Hospital, Manhattan Eye, Ear and Throat Hospital, Lebanon Hospital, Mt. Sinai Hospital, Brooklyn Jewish Hospital, Long Island College Hospital, Brooklyn Hospital, Italian Hospital, French Hospital, Columbia University, Roosevelt Hospital, St. Luke's Hospital, Post Graduate Hospital, Swedish Hospital, St. Francis Hospital, Lincoln Hospital, German Hospital of Brooklyn, Columbus Hospital, Staten Island Hospital, Polyclinic Hospital, New York Orthopedic Hospital, Hospital for Deformities and Joint Diseases, Metropolitan Hospital, King's County Hospital, Bellevue Hospital, City Hospital, Willard Parker Hospital, Kingston Avenue Hospital, Riverside Hospital, Montefiore Home, United States Naval Hospital.

Draft of Medical Men.—It is estimated that 144,000 men, of whom 24,000 must be trained physicians and the other 120,000 enlisted men, are required for service in the Medical Corps of the army. Half this number will be wanted by October 1. Two out of every nine physicians of military age, 22 to 55 years, in the United States and her possessions, will be called upon for war service. A system of selection is under organization, in order that, should the number of enlistments fall below the requirements, adequate forces of medical officers and enlisted men may be provided to insure a sufficiency of trained men to care for American troops at home and abroad. The first 12,000 men are available, and as fast as accommodations are provided they are going into training,—at the rate of 200 a day. The training camps are at Fort Riley, Kansas, Fort Benjamin Harrison, Indiana and Fort Oglethorpe, Georgia. Each camp has a capacity of 1000 medical officers and 1800 enlisted men, and includes, besides, four ambulance companies, four field hospitals, and one evacuation hospital. A fourth camp, of 550 men, is located at Fort Des Moines, and is for the training of colored medical officers and colored sanitary detachments to serve with colored troops. The ambulance service camp at Allentown, Pa., has about 4500 officers and men under training.

Massachusetts has sent between 400 and 450 doctors, who are for the most part being trained at Fort Benjamin Harrison. More men are needed from this section. Dr. H. D. Arnold of Boston has been commissioned major in the Reserve Medical Corps, and examines and certifies applicants for commissions in the corps, at Harvard Medical School.

Portable Hospital Unit.—The Massachusetts State Guard has adopted a portable hospital unit designed by its chief surgeon, Dr. William A. Brooks. It consists of four buildings—an operating room, a ward room, a kitchen, and a staff headquarters. The buildings can be easily erected, and can be dissembled, packed and transported in a short space of time, obviating the necessity of moving injured persons over distances to available hospitals. The unit has a complete equipment of hospital appliances, and can accommodate 125 patients. The staff includes the following:

Surgeons, Donald V. Baker, Brookline; William E. Broome, Boston; Harold G. Giddings, Allston; George W. Morse, Boston; Russell F. Sheldon, Boston; Benjamin E. Sibley, Brookline; and Edward A. Supple, Boston.

Physicians, John W. Dewis, Boston; and Thomas F. Harrington, Boston. Nose and throat diseases, George L. Tobey, Jr., Boston; and D. Harold Walker, Boston. Dental surgeon, Kurt H. Thoma, Boston. Roentgenologist, Ralph P. Leonard, Boston. Ophthalmic surgeons, Robert G. Loring, Boston; P. Smyth, Boston. Orthopedic surgeon, W. Russell MacAusland, Boston.

Transfer of American Ambulance.—The formal transfer of the American Ambulance at Neuilly, Paris, to the United States Government took place on July 22. The ceremony was held in a large ward of the hospital. It was attended by William Grave Sharp, the American ambassador; M. Godard, under secretary for war; Dr. Bouché, chief surgeon; Mrs. William K. Vanderbilt; and Colonel A. E. Bradley of the Medical Corps, U. S. A. M. Godard, in an appreciative address, requested that he be given the American flag flying over the Hospital, to place in the War Museum of France. Maj. George P. Reed of the Medical Corps, U. S. A., will be in charge of the hospital, and has requested the heads of departments and their staffs to remain on duty at the Ambulance.

Roosevelt Hospital Unit.—Red Cross Base Hospital No. 15, which was recruited from the Roosevelt Hospital, New York, is to be financed by Mrs. John W. Mackay and her son, Clarence H. Mackay. Miss Ellen and Miss Katherine Mackay, daughters of Mr. Clarence Mackay, presented to the unit, before it sailed for foreign service, a large American flag. The nursing staff is under the personal supervision of Mary L. Francis, formerly assistant director of nurses at Roosevelt Hospital.

Red Cross Commission to Italy.—It is announced that a commission will be sent to Italy by the American Red Cross, to learn conditions in that country, and institute measures which will most adequately provide for the needs of the soldier and the civilian population of Italy. The commission will consist of the following men: George F. Baker, Jr., vice-president of the First National Bank of New York City; John R. Morron, president of the Atlas Portland Cement Company; Dr. Thomas W. Huntington, president of the American Surgical Association; Dr. Victor G. Heiser of the United States Public Health Service; and Nicholas F. Brady, Central Trust Company, New York. Accompanying the commission is Chandler R. Post, professor of Greek and fine arts at Harvard University, and one of the leading authorities in this country on Italy.

Red Cross Roumanian Commission.—Members of the unit which the Red Cross is to send to Roumania include the following men: Henry W. Anderson of Richmond, Va., will head the mission. Other members include Arthur G. Glasgow of Washington, Dr. Francis W. Peabody of Boston, Dr. Roger Griswold Perkins of Western Reserve University, Cleveland; Dr. Robert C. Bryan of Richmond, Va.; Bernard Flexner, well-known lawyer of Chicago, and Dr. Gideon Wells of the University of Chicago Medical School. Dr. Peabody, who is resident physician at the Peter Bent Brigham Hospital, was graduated from the Harvard Medical School in 1907. In 1914 he was chosen a member of the China Medical Board of the Rockefeller Foundation and spent several months in China investigating medical education in that country.

Nurses for the Army.—The shortage of nurses on the west European front and the great need of a sufficient number to care for American troops, beside attending to the usual needs at home, has caused the nursing committee of the Council of National Defense to issue an appeal all over the country, urging young women to train themselves for nurses. In Massachusetts, Miss Mary Beard, of the Instructive District Nursing Association, has sent word to the deans and graduates of colleges, technical and high schools throughout the State, urging young women to enroll as nursing students and asking institutions to prepare to receive the increase. The general committee has also advised all nursing organizations to take a census of all nurses, graduates, attendants, aids, and the partly trained.

Selective Medical Draft.—It is reported that a petition sent from the Council of National Defense in Washington is being circulated, asking that Congress provide a selective draft of American doctors for military service and pleading for the exemption of *bona fide* medical men from the provisions of the present draft law. This is asked in fairness to the medical profession and in behalf of the welfare of the nation.

Appropriation for Hospitals.—It is announced from Washington that $14,500,000 will be spent in constructing thirty-two new army hospitals to be used in caring for the men in training in military camps. There will be nearly 400,000 men in the National Guard camps, and 500,000 in the National Army cantonments, an army of nearly 1,000,000, exclusive of the regular army of the United States.

Medical Officers' Reserve Corps.—Report from the War Department, Washington, on Aug. 4, announced the following New England appointments to the Medical and Dental Officers' Reserve Corps. All will be commissioned as first lieutenants.

Medical Corps. —John Jacob Custerhout, Keene, N. H.; John David Thomas, Burlington, Vt.; William Stickney, Rutland, Vt.; James Hamilton, Jr., Providence; Edward Silvanus Ward, North Attleboro; Herbert Bancroft Priest, Ayer; George Albert Russell, Arlington, Vt.; William Aloysius Malvery, Providence; Thomas Rice, Brattleboro, Vt.; John Frank Streeter, Springfield; Roger William Schofield, Worcester; William Francis Ryan, Lowell; Leon Stanley Lippincott, Brunswick, Me.; John Albert Sullivan, Pittsfield; Henry Albert Schneider, Pittsfield; James Madison Woodard, Salem; Melvin Harvey Walker, Jr., Pittsfield; James McFayden, Milo, Me.; Victor Anthony Aimone, Winchester; Louis Joseph Ullian, Boston; John Bishop Warden, Whitefield, N. H.; Harry Philip Casill, Boston; Louis Herbert Limaure, Lynn; Carl Thorburn Harris, Boston; Preston W. Whitaker, Unity, Me.; Frederick Leslie Gregory, Caribou, Me.; Joseph Michael Scanlon, Lawrence; Winfred Oren Brown, Littleton, N. H.; Frank Herbert Jordan, South Portland, Me.; George Roberts, Chester, Vt.; Andrew James McGraw, Taunton; Herbert Charles Scribner, Bangor, Me.; Ralph Miller Chambers, Westboro; William Phillips Bernard, Central Falls, R. I.; John Paul Jones, Wakefield, R. I.; Wilfrid Francis Milot, Attleboro; Bernard Andrew Bailey, Wiscasset, Me.

Dental Corps.—Walter Herbert Richardson, Worcester; Joseph Edward Cheney, Fitchburg; George Christman, Cambridge; Frederick Henry Winship, Jr., New Bedford; Edmund Martin Webb, Attleboro; Ralph B. Putnam, Portland; Harold Lee Peacock, Boston; Theodore Edward Lafayette, Jr., Watertown; Stanley Clifford Keene, Roslindale; Frederick Wilbur Day, Gardiner, Me.; Edward John Donovan, Wakefield; Frank A. Willis, Manchester; Edwin C. Baker, Roslindale; William F. Lynch, Somerset; Wilbur Arthur Charron, Ware; Clarence Simon O'Keefe, Taunton; James E. Cox, Charlestown.

Offer of Charlestown Medical Society.—The Charlestown Medical Society has offered its services to the Government in examining recruits, without remuneration, if desired.

Medical Reserve to be Called.—It is expected that the enlisted Medical Reserve Corps will be called to go into training within a few days. This will apply to the field hospital and ambulance companies and the unattached personnel of the reserve. The camp will be at Fort Ethan Allen, Vt.

Appointments of Navy Dental Surgeons.—Philip S. McGann of Somerville, Mass., and Joseph A. Tartre of Portsmouth, N. H., have been given probationary appointments as dental surgeons in the Navy.

Mental Tests for Soldiers.—A corps of one hundred and fifty neurologists and psychiatrists has been organized to examine all men under training at the army cantonments. In this way a man presenting any organic nervous disease, any mental defect, or a tendency to insanity, or who is addicted to drugs or alcohol, will be exempted from service. It is thus expected to eliminate from the fighting ranks of the army the men nervously and mentally unfit for the type of warfare necessary in the present conflict.

War Relief Funds.—On Aug. 25 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$248,669.12
Armenian Fund	217,392.56
Surgical Dressings Fund	120,503.01
French Orphanage Fund	117,656.38
Polish Fund	77,984.95
Italian Fund	44,157.72
French Refugees' Fund	25,059.99

Of these, 4 were isolated cases and the remaining 48 were connected with one outbreak.

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Aug. 18, 1917, the number of deaths reported was 173, against 222 last year, with a rate of 11.68, against 15.22 last year. There were 34 deaths under one year of age, against 53 last year.

The number of cases of principal reportable diseases were: diphtheria, 60; scarlet fever, 8; measles, 14; whooping cough, 34; typhoid fever, 7; tuberculosis, 52.

Included in the above were the following cases of non-residents: diphtheria, 3; scarlet fever, 1; measles, 1; whooping cough, 1; typhoid fever, 2; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 4; scarlet fever, 1; tuberculosis, 13; whooping cough, 2.

Included in the above was 1 non-resident death from tuberculosis.

Massachusetts Association of Boards of Health.—A regular quarterly meeting of the Massachusetts Association of Boards of Health was held recently at Pemberton, Mass. Dr. John F. Hitchcock was in the chair. Fred R. Johnson, secretary of the civilian relief committee of the Boston Metropolitan Chapter of the American Red Cross, read a paper on "The Red Cross in Relief in Civilian Communities." Dr. Charles E. Simpson, visiting health officer of the State Department of Health, read a paper on "Large Concentration Camps and Their Relations to Civilian Communities," referring to the army camps at Ayer and Framingham.

APPOINTMENT.

S. R. Klein, M.D., Ph.D., formerly director of the Research and Experimental Laboratory at Norwich, Conn., and Professor of Histology and Embryology at Fordham University Medical School, has been appointed Assistant Superintendent, Pathologist and Roentgenologist to the Waldheim East Sanatorium and Polyclinic, Oconomowoc, Wisconsin.

RECENT DEATHS.

Lorenzo Wait Cole, M.D., 65, died at his home in South Deerfield, Mass., Aug. 8, 1917, of bronchial pneumonia. Dr. Cole was born in Pittsfield, Dec. 19, 1851, and was the son of Dr. and Mrs. Harvey Cole. He was educated in the Pittsfield schools and in New York Medical College. He first practiced medicine in New York, near Albany, and in 1887 moved to Springfield, where he was a practicing physician for some years. Ten years ago he came to South Deerfield. Dr. Cole was married in Guilderland, N. Y., to Miss Carrie Hammett of Montpelier, Vt., June 30, 1873. Mrs. Cole survives him.

Isadore Hermanigilde Chicoine, M.D., died at his home in Lynn, Aug. 8, 1917, aged 52 years. Dr. Chicoine was a graduate of the Harvard Medical School in the Class of 1894, and had been a prominent practitioner of Lynn since he settled there in 1895 and joined the Massachusetts Medical Society.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

District Correspondents.

Berkshire, A. P. Merrill, M.D., Pittsfield.
Bristol North, Arthur R. Crandell, M.D., Taunton.
Bristol South, Edwin D. Gardner, M.D., New Bedford.
Essex North, T. N. Stone, M.D., Haverhill.
Essex South, H. P. Bennett, M.D., Lynn.
Hampden, Laurence D. Chapin, M.D., Springfield.
Hampshire, E. E. Thomas, M.D., Northampton.

Bristol South.—Drs. Erik St. J. Johnson, Frank E. Stetson, and William C. Sheehy have been appointed captains in the Medical Reserve Corps. Dr. C. E. Burt is at present training at Fort Benjamin Harrison, with the rank of first lieutenant. Dr. R. G. Provost has received his commission as first lieutenant, as have Dr. W. K. Turner, Dr. Frank W. Mathewson, Dr. William A. Moncrieff, and, I believe, Dr. A. de C. E. La Riviere. Others have taken the examination but have not received their commissions.

Just at present there is more or less talk about the new City Hospital. Trustees have been appointed, among them Dr. H. C. Kirby, who is the only trustee, I believe, who is a member of the Massachusetts Medical Society. A site of land has been bought, but that is as far as the project has gone. Dr. H. D. Prescott, who went to Saranac Lake something over a year ago, is reported as doing extremely well.

Edwin D. Gardner, *Reporter*.

Miscellany.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JULY, 1917.

GENERAL PREVALENCE.

The month of July was marked by a lack of epidemics of communicable diseases. There were 4601 cases of communicable diseases reported; a considerable decrease as compared with 10,214 cases in the preceding month and 5464 in July, 1916.

The most noticeable drop, in comparison with June, was in measles, which showed a decrease from 3785 cases to 1347 cases. The only significant increase was in pulmonary tuberculosis. This increase has now been steady since February, when 658 cases were reported.

Poliomyelitis.—There were 38 cases of poliomyelitis reported during the month. These were distributed in the district east of the Connecticut River and north of Brockton. The cases as a whole were distributed evenly in this section, except 10 cases which occurred in Haverhill and 5 in Lynn. No cases were reported in the Berkshires or in the Cape Cod district.

Smallpox.—One case of smallpox was reported from Worcester. The conditions are such that the outbreak of the disease in this city is apparently ended.

Typhoid Fever.—As compared with July, 1916, the State shows a decrease—109 cases this year, as against 128 cases for July last year. The total of the cases this year is slightly below the seasonal average. Of the 109 cases reported, 51 have been carefully investigated and show that 9 are due to contact with other cases, 5 are apparently due to eating raw shellfish, 2 from drinking polluted water. In 35, sources of infection could not be determined.

Diseases on the Premises of Milk Handlers.—One case of typhoid fever occurred in a family of a milk handler, and 5 milk farms were reported as having communicable diseases on their premises. Of the 5 farms, 3 had scarlet fever present in members of the family, and the other 2 farms had cases of septic sore throat on them. Suitable arrangements were made in 4 of the cases on the farms, so that the selling of milk was allowed to continue. On one farm where scarlet fever was present, due to the fact that the parents would not permit the child to go to a hospital, the milk supply was stopped for a few weeks until the local board of health regulations were followed.

EPIDEMICS AND OUTBREAKS.

Septic Sore Throat.—An epidemic of over 100 cases of septic sore throat, due to a hemolytic streptococcus, began during the last few days of the month in Wellesley, Natick and Dover. At the present time it is too early to state definitely the cause of this epidemic, but investigations are under way to determine the cause and to check its course.

Scarlet Fever.—An outbreak of 4 cases of scarlet fever occurred in the Medfield State Hospital as the result of a light unrecognized case of the disease. The cases were at once isolated, and the outbreak ceased.

Measles.—An epidemic of 53 cases of measles occurred at Westminster. Investigation showed that no physicians were called by many of the parents until the disease was well developed in their children, and thus no attempt was made to isolate the cases until it was widely spread throughout the community.

SMALLPOX IN MASSACHUSETTS.

There have been 52 cases of smallpox in the State during the first seven months of the year. Of these, 4 were isolated cases and the remaining 48 were connected with one outbreak.

The isolated cases were reported from Lee, Boston, Bernardston and Blackstone. The Lee case in January was apparently connected with the November, 1916, epidemic in that town, when 18 cases were reported. Of the 2 cases in February, one, in Bernardston, was a person just arrived ill from Iowa, and the other case, in Boston, was an individual from Connecticut, who was infected in that State. The Blackstone case was reported in June, and the source of infection was not found. The Boston and Bernardston cases had never been vaccinated, while the Lee and Blackstone cases were vaccinated in 1905.

The outbreak of 48 cases was centered in Worcester and started in January, when a Finnish immigrant arrived in the city from New York on January 4, apparently bringing the infection from a ship from Sweden on which smallpox was present. The first case was a fellow countryman, who lived in the boarding house to which the immigrant came.

Of these 48 cases, 9 died—a fatality rate of 18.7%, much higher than the usual type of disease prevailing in New England; at once suggesting, on its appearance, a new strain of the disease.

Of the 9 who died, 5 had never been vaccinated, 3 were vaccinated in childhood, from 20 to 60 years previously, and no history was obtained for one case.

Of the 39 cases that recovered, 17 were never vaccinated, 19 were vaccinated more than seven years previously, and 3 were vaccinated within seven years.

There were also 3 cases connected with the Worcester outbreak reported from Albany County, New York, by the New York State Department of Health, one of which was fatal. Of the 3 cases, none had been vaccinated.

In March, 5 cases were reported, and in April 5 cases. On April 26, a moulder, in the eruptive stage of the disease, attended a meeting of the local union, and 12 men attending the meeting later had smallpox.

Moulders from Fitchburg, Shrewsbury and Webster attended the meeting, and 4 cases in Fitchburg, and 3 each in Shrewsbury and Webster followed, making a total of 48 cases for the outbreak.

On the appearance of the outbreak, the Worcester Board of Health took rigid measures, isolating all cases in the city and in Shrewsbury, followed up by a house-to-house canvass of suspected cases and vaccination of all persons who might have come in contact with cases or infected material.

The last case appeared July 24, and the outbreak is apparently ended.

RARE DISEASES.

Anterior Poliomyelitis was reported from Beverly 2, Brockton 1, Groton 1, Groveland 3, Hadley 1, Haverhill 10, Lawrence 2, Lowell 3, Lynn

5, Malden 1, Medford 1, Quincy 1, Salem 1, Saugus 2, Springfield 2, Weymouth 1, and Worcester 1.

Cerebrospinal Meningitis was reported from Attleboro 1, Boston 4, Everett 1, Brockton 1, Haverhill 2, Malden 1, New Bedford 2, Northampton 1, and Pittsfield 3.

Dog-bite was reported from Attleboro 2, Dartmouth 2, Fall River 1, Medford 1, Northampton 1, Sunderland 1, and Worcester 1.

Dysentery was reported from Boston 7 and Holyoke 1.

Malaria was reported from Boston 6, Chicopee 2, Dedham 2, and Natick 1.

Pellagra was reported from Natick 1 and Milford 1.

Septic Sore Throat was reported from Arlington 2, Barnstable 2, Boston 1, Brookline 1, Cambridge 1, Dedham 2, Medford 1, Natick 12, Newton 1, Somerville 1, Springfield 1, and Swampscott 1.

Smallpox was reported from Worcester 1.

Tetanus was reported from Boston 1 and Gardner 1.

Trachoma was reported from Boston 1, Chelsea 2, Lynn 1, and Worcester 1.

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PREVENTABLE DISEASE.

Complete refutation of the claim that the Government does not concern itself with the loss from preventable disease is contained in the annual report of the Surgeon-General of the Public Health Service, recently submitted to Congress. Activities ranging from the prevention and cure of blindness, scientific studies of pellagra, the protection of the health of industrial workers, the prevention of the introduction of typhus fever, investigations of child labor and health insurance, the eradication of communicable diseases, and the control of the pollution of navigable streams, are recorded, and demonstrate conclusively that the national government is vitally concerned in the health of its citizens.

The most striking achievement of the year relates to pellagra, an affliction which in certain States destroys more lives than tuberculosis. Pellagra is no longer a disease of mystery, as the Public Health Service has clearly shown that it is caused by a restricted diet, and that it may be prevented and cured by means of a properly balanced ration. The practical application of this knowledge has already resulted in a material reduction in the prevalence of this affliction in all parts of the country, and it is confidently believed that in another year even more marked improvement will be observed.

In the eradication of trachoma marked success has been obtained. The methods followed—the converting of private residences into small hospitals and the holding of free open-air clinics—have been adopted by the Egyptian government. During the year 1700 persons were operated upon for the relief of partial or complete blindness, nearly 2000 received hospital treatment, while more than 19,000 were treated at hospital dispensaries and clinics. When it is realized that a large proportion of these people were doomed to years of suffering, terminating in at least partial blindness, and that they have been restored to lives of usefulness, in some instances even being taken from county poorhouses, where they had been public charges for the greater portion of their days, the importance of this most beneficent work can be imagined. The total cost of this undertaking, including the remodeling of buildings and every expense in connection with the feeding and care of patients, was less than $39,000 for the year.

Increased interest was shown by the government in the health of rural dwellers, and Congress has recognized, by making an appropriation for studies in rural sanitation, that the welfare of the country resident is not to be neglected. During the past three years 80,270 homes in 15 different counties of 13 states were visited and complete sanitary surveys made of the premises. In every instance definite recommendations were given to remedy such evils as existed, as, for example, the pollution of wells, the presence of disease-bearing insects, and the improper disposal of excreta. In addition, 22,234 homes were revisited, mostly at the request of the owners, in order that the government agents could inspect the improvements instituted. Wherever this method of bringing the lessons of sanitation directly to the rural dweller has been followed, a marked reduction has been observed in the prevalence of typhoid fever, hookworm, malaria, and other preventable diseases.

Attention has also been given to the health of the children of the nation, more especially to rural school children. Over 32,000 children attending the public schools were examined during the year in order to determine their mental status, and the causes and percentage of mental retardation and deficiency. In addition, 7000 physical examinations were completed for the determination of physical defects.

The health of industrial workers has been safeguarded to a greater extent than at any time in the past. Studies have been made of the occupational hazards of steel workers in many of the leading industrial establishments of the country, and unsanitary and harmful conditions corrected. In the zinc mines of Missouri methods have been adopted which should go far toward eradicating tuberculosis from that district. Investigations of child labor and of health insurance have also been made.

What is regarded as the largest and most important single undertaking of this nature yet inaugurafed, the investigation of the pollution of the Ohio river, is still in progress. Surveys of the Atlantic coast and New England watersheds have, however, been completed, and the extent and effects of their pollution are now known; this knowledge demonstrates that Federal legislation, to prevent the contamination of water sources, is a necessity.

Better provision for the health of travelers has been obtained by safeguarding the water supplies of common carriers, and through the promulgation of regulations governing the transportation of persons suffering from communicable diseases.

Energetic efforts have been made to prevent the introduction of all communicable diseases and to control those already present. Typhus fever has been combated at all points on the Mexican border, and disinfection plants established, where the clothing and persons of all incoming aliens have been disinfected. At one station alone—El Paso, Texas—26,000 persons were inspected and treated in such a manner as to insure their freedom from this highly fatal infection.

Plague eradicative measures at New Orleans have been continued. Over 371,000 rodents, the carriers of plague infection, were either trapped or killed, and more than 100,000 were carefully examined. No human case of the disease has occurred during the year. Measures for the control of typhoid fever, Rocky Mountain spotted fever, malaria and other infections have been continued as heretofore, and the results obtained have been most gratifying.

In only a single field,—the medical inspection of immigrants,—has the work of the Public Health Service shown any diminution during the year, but this has been compensated for by the more thorough examination accorded. 481,270 aliens were examined for the purpose of determining physical and mental defects. Of these, 16,327 were certified for deportation, proportionately a greater number than has ever been recorded. The percentage of mental defectives certified is also steadily increasing.

At the marine hospitals and relief stations of the service, approximately 9,000 beneficiaries received medical or surgical treatment, a number greater by 10,000 than for any previous year.

CANCER DECALOGUE PREPARED BY THE STANDING COMMITTEE ON THE CONTROL OF CANCER OF THE MASSACHUSETTS MEDICAL SOCIETY.

1. The classical signs of cancer are the signs of its incurable stages. Do not wait for the classical signs.

2. Early cancer causes no pain. Its symtoms are not distinctive, but should arouse suspicion. Confirm or overthrow this suspicion immediately by a thorough examination and, if necessary, by operation. The advice, "Do not trouble that lump unless it troubles you," has cost countless lives.

3. There is no sharp line between the benign and the malignant. Many benign new growths become malignant and should, therefore, be removed without delay. All specimens should be examined microscopically to confirm the clinical diagnosis.

4. Precancerous stage. Chronic irritation is a source of cancer. The site and the cause of any chronic irritation should be removed. All erosions, ulcerations, and indurations of a chronic character should be *excised*. They are likely to become cancer.

5. Early cancer is usually curable by radical operation. The early operation is the effective one. Do not perform less radical operations on favorable cases than you do on unfavorable ones. The chances for a permanent cure are proportionate to the extent of the first operation. Make wide dissections; incision into cancer tissue in the wound defeats the object of the operation and leads to certain local recurrence.

6. Late cancer is incurable, though not always unrelievable. Radium, x-rays, ligation, cautery, or palliative operations may change distress to comfort and may even prolong life.

7. Cancer of the breast. All chronic lumps in the breast should be removed without delay. Benign tumors can be removed without mutilation. Examine all specimens microscopically. An *immediate* microscopical examination is desirable since, if positive, it permits a radical operation at the same sitting. A radical operation performed ten days after an exploration is almost never successful in curing cancer of the breast.

8. Cancer of the uterus. Any irregular flowing demands thorough investigation. Offensive or even very slight serous flows are especially suspicious. Curette and examine microscopically. Amputate all eroded cervices which do not yield promptly to treatment. Do not wait for a positive diagnosis.

9. Cancer of the digestive system is difficult of early diagnosis, and therefore unfavorable in prognosis. All persistent and recurring indigestions (more especially if attended by change of color and loss of weight) and any bleeding or offensive discharges demand prompt and thorough investigation. Do not wait for a positive diagnosis.

10. Cancer of the skin. Any warts, moles, or birthmarks which enlarge, change color, or become irritated, should be removed promptly. They are likely to become cancer. Do not wait for a positive diagnosis.

BACTERIOLOGY AT THE FRONT.

Bacteriological investigation in hospitals of the front line has been a novel feature of this war. Nothing of the kind has been practised in any of our previous campaigns. It has been rendered possible by equipping motor vans as mobile laboratories. The first, which was sent out in October, 1914, had been a pleasure caravan. It was gutted and fitted with incubators and all the other apparatus of bacteriological work, and was followed by many others of the same type. They have been attached to a clearing station or a group of clearing stations, and the officer in charge is provided with a small motor car, so that he can go to any place in his area where his services may be wanted.

These officers perform three functions:

1. They examine all kinds of morbid products from the hospital wards, and thus aid in the diagnosis of enteric fevers and other epidemic diseases on the medical side, and of the various forms of infection that attack surgical wounds.
2. They examine contacts in cases of infectious fever and search for carriers, both among the troops and in the civil population.
3. They investigate new forms of disease that appear among the troops, in order to discover their causes and the means of prevention.

Instances of the first class of work are the examinations made of the blood and excreta in cases suspected of enteric fever, of malaria, or of dysentery, and of the cerebrospinal fluid, or the nasal mucus where cerebrospinal fever is in question.

The next function of these officers is to discover the source of an infection, and to stop it from spreading. In cases of enteric fever, the work was very elaborate. In the first place, a systematic search was made for recent or chronic carriers among the troops. Thus, in one regiment a carrier was discovered in the regimental kitchen. In another, which had lately received enforcements, no less than 95 men had to be examined before the carrier was found. But the source of infection was not always in the troops. The part of Flanders that we held was a hotbed of enteric fever, and many cases were found in the civil population. The search for these was very difficult. In one village cases of enteric fever occurred in three successive formations that were billeted there.

The conditions of warfare made it far less possible to obtain contacts of cerebrospinal fever at the front, where men are constantly moving, than it is at home where a man may be stationary for weeks.

As instances of the examination of new or little known forms of disease, I may mention trench fever, investigated by Captain McNee; spirochetal fever by Captain Adrian Stokes; gas gangrene, and the histology of the prevalent nephritis, by Lieutenant Dunn.—Sir W. P. Herringham, C.B., M.D., *British Medical Journal*, June 23, 1917.

Correspondence.

CONCERNING CERTAIN MEDICAL ADVERTISEMENTS.

New York, August 15, 1917.

Mr. Editor:—

Permit me to call your attention to the new law relating to certain medical advertisements, which was enacted at the last session of the New York State Legislature. The passage of this law was prompted by the fact that the misrepresentation practiced by quacks and unscrupulous nostrum manufacturers constituted one of the chief obstacles encountered by health authorities in dealing with venereal diseases. Much of this misrepresentation appears in the advertisements still carried by certain newspapers and periodicals published in this city.

> "1142-a. Advertisements relating to certain diseases prohibited. Whoever publishes, delivers or distributes or causes to be published, delivered or distributed in any manner whatsoever an advertisement concerning a venereal disease, lost manhood, lost vitality, impotency, sexual weakness, seminal emissions, varicocele, self-abuse or excessive sexual indulgences and calling attention to a medicine, article or preparation that may be used therefor or to a person or persons from whom or an office or place at which information, treatment or advice relating to such disease, infirmity, habit or condition may be obtained, is guilty of a misdemeanor and upon conviction thereof shall be punished by imprisonment for not more than six months, or by a fine of not less than fifty dollars nor more than five hundred dollars, or by both such fine and imprisonment. This section, however, shall not apply to didactic or scientific treatises which do not advertise or call attention to any person or persons from whom or any office or place at which information, treatment or advice may be obtained, nor shall it apply to advertisements or notices issued by an incorporated hospital or a licensed dispensary or by a municipal board or department of health or by the department of health of the State of New York."

You will observe that the law applies both to the advertiser ("who causes to be published") and to the publisher of this class of advertisements. The new law goes into effect Sept. 1st, 1917.

Very truly yours,
Charles Bolduan,
Director, Bureau of Public Health Education.

◆

END OF A FAMOUS NEUROTIC IN-BRED LINE.

Boston, August 9, 1917.

Mr. Editor:—

Lord Byron's line would not have died out, under ordinary circumstances, apparently without notice in either hemisphere. Even now, the subject is worth enlarging upon by some psychopathologist, and the hope of inducing this, causes the present note. Baroness Wentworth (peeress in her own right) died childless on June 18th, the greatgranddaughter of Lord and Lady Byron; the latter was a hereditary hysteric, and the former came of a strain whose mental instability had been intensified by an extraordinary number of cousin-marriages. One of the closer connections was aired by Mrs. H. B. Stowe, with manifold indiscretion, fifty years ago, but recently has been handled deftly by Miss Mayne. When one considers that Lord Byron, a typical only child, surrounded by such, and by superstition, came of stocks psychopathic on both sides, and lived in a hectic society, the wonder grows not that he did not behave better, but that he could behave at all.

Alfred Ela.

The Boston Medical and Surgical Journal

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Address.

THE NEWER METHODS OF DIAGNOSTIC TECHNIC.*

By Frederick T. Lord, M.D., Boston.

Most mistakes in diagnosis arise from insufficient attention to the patient's story, neglect in the performance of a complete and searching physical examination or lack of skill in their interpretation. To a certain degree, diagnostic errors are unavoidable, but their frequency is materially diminished by the routine use of a carefully prepared scheme of history-taking and physical examination, elaborated to apply in appropriate detail to certain groups of cases and designed to avoid well-known errors of omission. Proficiency can be acquired and maintained at its highest level only by constant practice and the steadying influence of opinions corrected or confirmed.

If we are to secure to its fullest extent the educational value to be derived from our successes and failures, a written opinion should be incorporated in the patient's hospital record after the completion of the clinical data. The limits of accuracy in diagnosis then become more apparent if the case later comes to operation or autopsy. It is obviously impossible at this time to cover the numerous more recent developments which have contributed to the science of diagnosis, with any degree of completeness. I shall, therefore, attempt to consider only certain aspects of the subject.

CERTAIN ASPECTS OF HISTORY TAKING.

An important division in our records, in addition to the older form of the family history, past history, habits, and present illness, deals with the occupational history. At the Massachusetts General Hospital, Dr. Wade Wright has made an investigation of the cases in which the hazards of industry have a bearing on the illness, and out of about thirty-two thousand admissions to the Out-Patient Department during a period of one year, about five thousand were received in his industrial clinic. In four hundred and sixty-six cases there was a definite relation between the illness and the occupation,—a proportion of from one to two patients per one hundred of the total out-patient admissions. Out of this number, of four hundred and sixty-six cases, exposure to lead is shown to be a hazard of chief importance, being represented by one hundred and forty-eight cases.

An important rule in history-taking is to try to make the diagnosis from the history alone, and no history can be regarded as complete until this effort has been made. An inquiry, at times of great value, concerns the evolution of the initial symptoms, a matter the importance of which can be appreciated when we consider how the advent of complications may later confuse the clinical picture. It is, for example, highly desirable to inquire concerning the attendant symptoms in cases with a history of hemoptysis. If it can thus be shown that the bleeding was unaccompanied by other symptoms referable to the lungs or other organs, and was, in fact, an "hemoptysis out of a clear sky," then pulmonary tuberculosis may be regarded as the probable cause of the bleeding. A history of pleurisy out of a clear sky has a similar significance. In the case of a child with the history of having "swallowed something and choked," an initial dysphagia, with absence of cyanosis, paroxysmal cough, dyspnea and suffocation suggests lodgment of a foreign body in the esophagus. The immediate occurrence of respiratory symptoms, on the other hand, may be the most valuable evidence obtainable that a foreign body has been aspirated. In certain cases there is an initial period of dysphagia, with the later development of cough, dyspnea and cyanosis,—a march of events highly suggestive of a swallowed body which has subsequently ruptured into the air passages. There is a group of cases in which the distinction between bronchial and cardiac asthma can be made only by careful inquiry concerning the progress of the early manifestations. Persistent and increasing dyspnea usually precedes the asthmatic attacks due to cardiac failure, while in true bronchial asthma such attacks are at first isolated and without dyspnea in the intervals between the paroxysms. Chill or chilliness, pain in the side, dyspnea and cough, with bloody expectoration, are common to both lobar pneumonia and pulmonary infarction, but in pneumonia the temperature rises rapidly, and reaches its maximum within a few hours. In pulmonary infarction the temperature rises much more slowly. If this difference in the behavior of the temperature can be determined, it may help to solve the problem.

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* Presented at the Annual Meeting of the New Hampshire Medical Society, May 16, 1917.

It is equally important to trace out the progress of symptoms in other than pulmonary conditions. I need only remind you that the diagnosis of coronary sclerosis cannot be made without attention to the significance to be attached to the various features which characterize angina pectoris. Dr. Brickner's description, which you have just heard, of the cord symptoms in certain of his cases of spina bifida, suggests the importance of reverting to the earlier manifestations when there are indications of sensory or motor impairment. A history of the disassociation of sensory perception in the earlier stages of a motor disturbance of the lower extremities is suggestive of unilateral lesions of the cord, and may lead to detection and removal of a spinal tumor. Spasm and tingling, limited to certain motor and sensory areas, preceding more extensive involvement, may be a signal symptom of irritative or destructive lesions of the central motor area of the brain, and serve to define the site of a cerebral tumor. The diagnosis of abdominal lesions must be made for the most part from the history, and the statement of the patient concerning the site, radiation, character, severity and duration of pain, among other features, is of chief importance.

MATTERS PERTAINING TO PHYSICAL EXAMINATION AND THE CLINICAL LABORATORY.

As with history-taking, physical examination must be complete if we are to avoid error, and must comprise also an examination of the blood, the determination of the blood pressure, a Wassermann test and analysis of the urine, including the sediment, as a routine. Certain cases demand further special regional investigation.

Nervous System. The use of the electric otoscope makes examination of the ear much more readily performed now than formerly, and this instrument should be a part of our equipment. In patients who are gravely ill and whose sensibilities are diminished below the normal, an acute otitis media may develop without symptoms. In the examination of the ears in cases of pneumonia, especially in children, an unsuspected inflammation of the middle ear is not an infrequent finding, and inspection of the ear drum should, therefore, be made in such cases, as a routine.

With the added accuracy which the Wassermann test has brought to the diagnosis of syphilis, it appears that inequality, irregularity and sluggish reaction of the pupils to light is to be regarded as suggestive of luetic infection, even in the absence of other manifestations of the disease.

The conversion of the ophthalmoscope into an electrical instrument makes it readily available for more general use. This is fortunate, for it should be an invariable rule to examine the fundus before resorting to lumbar puncture and the withdrawal of spinal fluid, so frequently desirable as a diagnostic procedure. Optic neuritis and choking of the disc are important signs of increased intracranial pressure, and when present constitute a contraindication to the withdrawal of spinal fluid without due consideration of the danger. Pressure on the medulla, and consequent apnea may occur from herniation of the base of the brain into the foramen magnum on the release of spinal pressure. In cases suspected of cerebral tumor, with increased intracranial tension sufficient to produce optic neuritis or choked disc, the withdrawal of spinal fluid should not be undertaken if the diagnosis can be satisfactorily established without this means. Similar changes are occasionally observed in the eye grounds in cases of meningitis, however, and caution must not be carried so far as to lead to the omission of lumbar puncture in such cases, and consequent failure in the diagnosis and serum treatment of meningococcus infection.

If syphilis of the central nervous system cannot be excluded without an examination of the spinal fluid, lumbar puncture may be justifiable, even in the presence of changes in the eye grounds, indicating increased intracranial pressure.

In the performance of lumbar puncture for the purpose of obtaining spinal fluid for examination, an important caution should be observed in the choice of an instrument, that it be made of pliable material, which will bend and not break in the course of the procedure. It has been the unfortunate experience of a number of operators to have a steel needle break, and a part of it remain imbedded and out of reach in the lumbar tissues. I need hardly remind you that the recovery of such a fragment may be difficult or impossible without resort to x-ray examination, and an operative procedure quite out of keeping with the already serious condition of the patient.

The examination of the spinal fluid should include a numerical and differential count of the cells, a test for protein and the Wassermann test. Patients with spinal fluids which contain pus cells should be treated as for meningococcus infection until the cause of the disturbance can be definitely determined. Inasmuch as there is promise of successful serum treatment of influenza meningitis, and the influenza bacillus grows only on hemoglobin-containing media, it is desirable, in the investigation of the fluid by culture, to plant it upon blood-agar, as well as on other media. An increase in and predominance of lymphocytes in the spinal fluid usually mean that chronic meningococcus infection, acute anterior poliomyelitis, tuberculous meningitis or syphilis, is the underlying condition. So far as the diagnosis of syphilis is concerned, this is never complete in suspected and otherwise negative cases until an examination of the spinal fluid has been made. We see each year a small group of cases with negative Wassermann tests on the blood and positive tests on the spinal fluid, as the only certain indication of syphilis.

An increase in the protein content of the spinal fluid may be demonstrated by various means. Noguchi's butyric acid test is performed by adding to one part (0.1 to 0.2 cc.) of the fluid, five parts (0.5 cc.) 10% butyric acid in normal salt solution and heating to boiling. One part (0.1 cc.) of normal sodium hydroxide solution is then added, and the mixture again boiled for a few seconds. In strongly positive specimens a precipitate appears within a few minutes. Weakly positive reactions may appear after a longer period, but if the fluid remains clear after two hours it may be regarded as negative. Nonne's test is applied by adding an equal volume of saturated ammonium sulphate solution to the spinal fluid, which should be free from blood. A positive test is indicated by the appearance of a precipitate within three minutes. Protein reactions are not specific, and serve only to demonstrate pathologic fluids without regard to the character of the underlying cause.

RECOGNITION OF CARDIAC IRREGULARITY.

With regard to cardiac cases, an interesting advance has been made by the use of instruments of precision in the diagnosis and classification of the arrhythmias. After some experience in the comparison of clinical and instrumental findings, it is possible to recognize the types of cardiac irregularity in most cases without resort to polygraphic and electrocardiographic tracings. Of the two relatively benign forms, sinus irregularity is a common, youthful type, characterized by the recurrence of cardiac systoles for a short period at a more rapid rate, this acceleration of the rapidity being followed by an interval of slower beats. Imperfect and missed beats are absent, and the acceleration of rate usually occurs during inspiration, with slowing of the rate during expiration. The second of the two relatively benign types is known as extra-systole, which can be recognized by the occurrence of a beat at a shorter interval than the natural beat, a subsequent longer pause before the next systole, and the resumption of normal rhythm. In the absence of symptoms or other signs of cardiac disturbance, extra-systoles need not be regarded as of serious import. There are three types of arrhythmia which may be taken to indicate more or less serious damage to the cardiac mechanism. Of these, auricular fibrillation is usually easily recognized by the repetition of cardiac beats of unequal intensity at irregular intervals, in a disorderly and nondescript fashion. With pulsus alternans, a strong and weak beat alternate, without disturbance of the orderly succession of the sounds at regular intervals. This type is most easily detected in the course of estimation of the blood pressure by the auscultatory method, the disparity in the strength of the alternating beats being accentuated when on listening for the appearance of the systolic sounds at the bend of the elbow, the strong beat first appears, and then, as the pressure is further lowered, the alternating and weaker beat is heard. In partial or complete heart-block, there is a slow ventricular rate with a more rapid contraction of the auricle. The more rapid auricular beats may be counted in the distended jugular vein. Fluoroscopic examination of the chest may disclose the rapid auricular and the slow ventricular rate. Cerebral attacks are likely to accompany the transition from normal rhythm to heart-block. While the more outspoken types of the arrhythmias are recognizable without instrumental assistance, polygraphic or electrocardiographic tracings may be necessary for the detection of the earlier stages of heart-block and the distinction between extra-systoles and fibrillation and heart-block and alternation.

SELECTION OF DONORS FOR TRANSFUSION.

The increasing frequency with which transfusion is done in secondary anemia, as a lifesaving measure or as a preliminary to operation, and in pernicious anemia as a temporary expedient, makes familiarity with the technic of selecting an appropriate donor desirable. Otherwise a valuable procedure will sooner or later receive unmerited condemnation in consequence of a fatality from the mixture of incompatible blood. Detection of incompatibility is not a difficult or complicated process, and in other than emergency cases transfusion should never be performed without preliminary tests for agglutination. When the selection of appropriate donors is a frequent necessity, it is desirable to follow Moss' (*Journal American Medical Association*, June 23, 1917) method of group determination by testing the blood of prospective donors against Group II and Group III serum, which is kept constantly on hand in the laboratory. It is most important to observe the rule that the corpuscles of the donor must not be agglutinated by the patient's serum. Agglutination of the recipient's corpuscles by the donor's serum appears to be less dangerous. In the absence of stock sera five to six drops of the recipient's, and an equal quantity of the donor's blood may be collected, each in small test tubes, and the serum allowed to separate from the clot. One to two drops of the prospective donor's and the recipient's blood are each mixed with one cubic centimeter of 1.5% sodium citrate in 0.9% salt solution. Two loops of the recipient's serum and one loop of the donor's suspension of corpuscles are mixed together on a glass slide, covered with a cover glass, and watched for agglutination under the microscope. Two loops of the donor's serum and one loop of the recipient's suspension of corpuscles are mixed and similarly tested. Rouleaux formation should not be mistaken for agglutination. Observation for five minutes may be sufficient, but a half hour is a safer limit.

DETERMINATION OF THE TYPES OF PNEUMOCOCCI.

The detection of the types of pneumococci giving rise to lobar pneumonia is a matter which should be taken under consideration in this and other communities. Immunologic and agglutinative tests have shown that there are four principal types of pneumococci concerned in the disease. The treatment of pneumonia due to Type I pneumococci, by the homologous serum, has reduced the mortality of this type of infection from 30 to 8%. Anti-pneumococcic serum for the treatment of Type I infection is manufactured both by the New York City and the New York State Board of Health. The State Department of Health of Massachusetts has requested from the Legislature a sufficient amount of money to provide for the preparation and distribution of Type I serum. As a number of months must elapse after all preparations are made before a potent serum can be obtained from inoculated horses, the present is the time to consider such a provision. We should take heed from the history of the disease, and realize that cases of pneumonia are likely to become much more numerous next winter than ever before. Their incidence is likely to rise in consequence of the increased opportunity for contact infection among troops in the course of our military operations. Pneumonia has not long since been noted to become more prevalent in such crowded conditions of living as among the negroes employed on the Isthmian 'Canal and housed in barracks, and among the workers in the mines of the Rand. It is hardly to be expected that the supply of serum for which provision has been and is being made in New York and other places, will be equal to the demand.

EXAMINATION OF SEROUS FLUIDS.

The value of an examination of fluid obtained from the serous sacs is too little heeded. Complicated and expensive apparatus is unnecessary, and such simple tests as the specific gravity, the estimate of the amount of albumen, and a differential count of the cells in such fluids are important aids in determining the cause of the effusion. With pleural fluids, for example, a specific gravity of 1010 or under, and traces to 1% of albumen, usually indicates a hydremic transudate. Fluids with a specific gravity of 1010 to 1015 and from 1 to 3% of albumen are usually passive transudates. When the specific gravity is 1018 or over, and the albumen 4% or more, an inflammatory origin may be assumed. An excess of polynuclear cells in serous fluids of high specific gravity commonly indicates an infection of other than tuberculous origin, while an excess of lymphocytes in such fluids usually means that tuberculosis is the underlying cause.

X-RAY EXAMINATION.

From the point of view of medical diagnosis, radiography is of material assistance in certain cases. Involvement of the paranasal sinuses and concealed pockets of pus about the teeth may thus be detected. The nature of lesions of the mediastinum and the lung can be interpreted with much greater accuracy when, to the clinical features, an x-ray examination can be added. X-ray examination should, so far as possible, be secured in all cases. To improve our technic in the application of the ordinary methods of examination, it should be an invariable rule to incorporate in the record all physical pulmonary findings before the x-ray plates are inspected, and then note the discrepancies between the two methods. It not infrequently happens that more is disclosed by the radioscopic than by the physical examination.

In abdominal cases the use of the x-ray is of great assistance. The findings by this method should be judged with, and not independently of, the clinical features, if their utmost value is to be realized. The method is of greatest service in the medical wards in the investigation of gastric cases. Abnormalities in the stomach can, by this means be demonstrated in practically all cases of carcinoma in its more advanced stages, and a negative x-ray is of great value in excluding such lesions. The x-ray differentiation of carcinoma and ulcer is often impossible. Carcinoma is not yet detected early enough by any means to make the outlook for surgical interference hopeful in other than rare instances.

Peptic ulcer presents a high proportion of successful interpretations, but negative x-ray findings do not serve to exclude ulcer. Gallstones are usually missed by x-ray examination, and we place little reliance on negative plates of the gall-bladder region. In only a small proportion of patients shown by operation to have gallstones have the x-ray findings been undoubtedly positive, and in a large proportion of cases we must still make the diagnosis of cholelithiasis on the clinical features. The x-ray is indirectly of value, however, in helping to exclude peptic ulcer when peptic ulcer or gallstones is in question. Stone in the urinary tract, on the other hand, is shown in almost all cases, especially when, by appropriate means, care is taken to include an examination of its pelvic portions. Progress is constantly being made in the study and interpretation of lesions of the small and large intestine, but chief reliance must still be placed on other methods of investigation.

PROCTOSCOPY.

Lesions of the lower bowel within easy access of the anal orifice can at times be diagnosed by means of proctoscopy when other methods fail. The proctoscope is of greatest value in the early detection of carcinoma in this region. It is simple and easily operated. A small, portable battery affords adequate illumination from the small lamp with which the end of the tube is equipped.

ESTIMATION OF RENAL FUNCTION.

In doubtful cases of disturbed renal function, the phenolsulphonephthalein test is desirable and easily performed. Ampules containing enough of the drug for one test are on the market. Three to four hundred cubic centimeters of water may be given the patient to drink a half hour before the test is made. Six-tenths of a milligram of the phenolsulphonephthalein are injected intramuscularly. The bladder is emptied in one hour and again in two hours after the injection. A sufficient amount of 25% sodium hydroxide is added to each of the two specimens of urine to make them strongly alkaline, and the samples are then diluted with water to a volume of one liter. Comparison of the color of a small portion of the diluted first-hour specimen is made with a color scale and the percentage read off. A similar estimate of the color is made on the diluted second-hour specimen. The sum of the percentage of excretion for the two specimens represents the total eliminated during the two-hour period, and may be taken as a fair index of the function of the kidneys. A total output of from 60 to 85% for the two hours may be regarded as normal. In patients with urinary obstruction the specimens of urine must be obtained by catheter, but in the absence of obstruction the use of the catheter is unnecessary.

TESTS FOR ACIDOSIS.

In diabetes an advance may be noted in the addition of a simple and accurate measure of the reaction of the body in the presence of acidosis by an estimation of the quantity of ammonia excreted in the urine. The determination of the total twenty-four-hour output of ammonia is easily made by means of the Ronchese-Malfatti method.* The test is unreliable, however, when the patient is under treatment by alkali. The ferric chloride test for diacetic acid in the urine is of value in indicating the amount of acid excreted. Other tests for acidosis are thus far too complicated for general use.

DIAGNOSIS OF EARLY STAGE OF SYPHILIS.

Finally, the early diagnosis of syphilis, of paramount importance in successful treatment, is made easily possible without complicated and expensive apparatus by the India ink method of finding the spirocheta pallida. A loop of serum squeezed from the previously cleaned lesion under suspicion is mixed on a cover glass with two loops of India ink,† and the mixture covered with a second cover glass. The two cover glasses are then pulled apart, dried, mounted in balsam, and examined under the oil immersion lens.

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* (1) 25 cc. urine in Erlenmeyer flask + 25 cc. distilled water + 10 grams solid potassium oxalate (neutral). Add few drops phenolphthalein. Shake a few times to dissolve the potassium oxalate and titrate with one-tenth normal NaOH until the first pink color is permanent. (2) 5 cc. commercial formalin solution in test tube + few drops phenolphthalein. Titrate with one-tenth normal NaOH until a faint pink color is obtained. (3) Now add the neutralized formalin to the neutralized urine and again titrate with one-tenth normal NaOH until a faint pink color is again obtained. Calculation: No attention need be paid to the amount of one-tenth normal NaOH used in (1) and (2). The number of cc. one-tenth normal NaOH used in (3) multiplied by .0017 equals the number of grams NH_3 in 25 cc. urine. From this result calculate the amount for the 24-hour urine. From 0.5 to 1.0 grams in 24 hours is normal.

† Chin-chin India ink is best.

Medical Progress.

A REVIEW OF THE LITERATURE OF THE LAST NINE YEARS ON THE NEPHRITIS OF INFANCY AND CHILDHOOD.

By Lewis Webb Hill, M.D., Boston,

Alumni Assistant in Pediatrics, Harvard Medical School; Junior Assistant Visiting Physician, Children's Hospital, Boston.

Although in the last few years an immense literature has grown up concerning nephritis in the adult, it is surprising to see how little has been written about the condition in children. Nephritis is really an extremely common condition in childhood, following, particularly, the various acute infections to which children are so susceptible.

The following review covers most of the important papers of the last nine years:

Etiology. Hutinel[1] insists strongly that infection dominates the etiology, thus differing widely from nephritis in the adult, in which slow degenerative processes play the chief etiological rôle. This, indeed, is the first important distinction to be drawn between nephritis in the adult and in the child. The nephritis following scarlet fever is, perhaps, the most common type of nephritis in childhood, according to Hutinel, and he believes that the scarlet fever toxin may be relatively harmless to the kidneys unless the factor of cold is added; many cases of scarlatinal nephritis would not develop if the body had not been chilled. The following are a few of the conditions to which nephritis may be secondary:

1. Scarlet fever.
2. Infections of the pharynx [tonsillitis especially important.—L. W. H.]
3. Gastro-intestinal diseases of infancy.
4. Skin infections, especially impetigo.
5. Appendicitis.

Kaumheimer[2] calls especial attention to the importance of impetiginous skin conditions as etiological factors. Out of 223 cases of acute nephritis seen by him, 39 were unquestionably due to impetigo. In nearly all of these 29 cases the nephritis was of the acute hemorrhagic variety, with edema. The prognosis is good.

Phillips[3] also emphasizes the importance of impetigo in etiology. He recognizes two types of nephritis secondary to this condition:

1. A nephritis of transitory character, without edema, or cardiac or uremic symptoms. The urine contains a few casts, and a very few red blood cells, barely enough to give the urine a red color.

2. A nephritis which is more severe, characterized by general anasarca, cardiac or uremic symptoms. He believes that the urine should be examined as a routine in all cases of impetigo.

McLanahan[4] says that nephritis is much more common in childhood than the textbooks would lead one to believe. He emphasizes especially the fact that nephritis may occur in any infectious disease of childhood. In 15 cases of acute nephritis seen by him, the etiology was as follows: scarlet fever, 4; tonsillitis, 3; "grippe," 4; infectious diarrhea, 1; unknown etiology, 3.

Loeb[5] discusses nephritis from the point of view of the rhinologist. He arrives at the following conclusions:

1. Acute nephritis results from acute tonsillitis far more often than is usually believed.

2. The symptoms are not manifested until some time after the inception of the disease.

3. There are probably many cases in which a mild nephritis occurs secondary to a tonsillitis, which goes on to resolution without the patient or physician being conscious of its presence.

4. It is incumbent upon practitioners to examine the urine of every case of tonsillitis, not only during the height of the disease, but for some time afterwards, as well.

5. Spontaneous or "idiopathic" nephritis is probably often due to a tonsillitis that has not been considered as an etiological possibility.

6. Chronic affections of the kidney may very well owe their origin to unrecognized acute attacks of nephritis of tonsillar origin.

Loeb wrote particularly with regard to adults, but his conclusions hold good for children even more than they do for adults. The importance of tonsillitis in the etiology of acute nephritis in children cannot be overestimated, and in a series of some sixty cases which we have studied at the Children's Hospital during the last two years and a half, tonsillitis has been by far the most frequent cause of the nephritis.

Frank[6] studied an extensive series of cases of acute nephritis in early infancy, and brings out especially the facts that no child is too young to have nephritis, and that under the first year of age a large proportion of the cases are of gastro-intestinal origin.

Pribram[7] reports 4 cases of acute hemorrhagic nephritis following tonsillitis, which were cured by tonsillectomy, without any other medicinal or dietetic treatment.

Classification. Heubner,[8] from an analysis of 73 cases of chronic nephritis in his wards, proposes the following classification:

1. Chronic hemorrhagic nephritis is a quite characteristic type of nephritis in childhood. In this group the urine contains blood consistently over a long period of time. The amount of blood and of albumin is usually considerable, and casts are present in abundance. This type is nearly always associated with edema, and the duration is years. In some cases the heart is hypertrophied and there is an increase in blood pressure; in some there is none. At autopsy the kidneys of these cases are always large, yellow, and studded with many small hemorrhagic areas.

2. Clinically, the cases of this group are very similar to those of the previous; they differ only in that blood is lacking. In nearly all cases the blood pressure is normal. The duration of this type of nephritis is shorter than that of the hemorrhagic form, and children with it nearly always die after a few months. At autopsy the "large white kidney" is seen.

3. The third group of cases comprises those children with true contracted kidney (chronic interstitial nephritis). This is very rare; in Heubner's 73 cases, only one was of this type. The symptoms are very much the same as in the adult type of chronic interstitial nephritis: high blood pressure, enlarged heart, polyuria, albuminuric retinitis, etc.

4. Chronic nephritis following pyelitis. This also is uncommon, only 6 of the 73 cases falling into this group.

5. The fifth type is a nephritis without edema, in which one would not suspect a nephritis unless the urine were examined. The nephritis may go on for months or years without

being discovered, and when the urine is examined as a routine because the child is perhaps brought to the physician for pallor, loss of appetite or vigor, the nephritis is discovered. The albumin is usually present in only small amounts, but there may be a good many casts and red blood cells, which may vary considerably in number from time to time. In this type small hemorrhages from the kidney are particularly likely to occur from time to time. These hemorrhages nearly always occur during some acute illness, especially tonsillitis, the toxins of which irritate the already diseased kidney. This is a very mild type of nephritis and may last for years. The blood pressure is usually normal. In closing, Heubner says that nearly all cases of nephritis in infants and children, whether acute or chronic, can usually be traced to an infection of some sort.

Langstein and Benfey,[9] following Heubner's work closely, recognize the following 6 types:

1. A chronic hemorrhagic form, nearly always accompanied by edema. This type of nephritis is the most common and characteristic nephritis that children have.
2. A second form is first shown by edema, but has no blood in the urine. The amount of albumin, however, is very large, and there are many casts present. Infectious processes are likely to be the cause of the nephritis in the first group, but not so likely in the second.
3. True chronic interstitial nephritis of the adult type.
4. A parenchymatous nephritis secondary to pyelitis.
5. A form of nephritis coming on very insidiously, and manifested by general debility of the child. The urine contains a small amount of albumin, a moderate number of casts and leucocytes, and from time to time a few red blood cells. It is very likely to follow scarlet fever or tonsillitis.
6. Intermittent albuminuria—rare, and of very little practical importance.

As can be seen, this classification is essentially the same as Heubner's.

Blackman[10] proposes the following classification, based upon etiology:

1. Of Infancy:
    - (*a*) Of gastro-intestinal origin.
    - (*b*) Due to other infections.
    - (*c*) Due to congenital syphilis.
2. Of Older Children:
    - (*a*) Scarlet fever and diphtheria.
    - (*b*) Other infections.
    - (*c*) Cold, exposure and drugs.

Congenital Nephritis—Nephritis in the New-born. Karsner[11] reports a case of congenital nephritis. The child was cyanotic at birth, and died 45 minutes afterwards. At autopsy there was found a well-defined acute parenchymatous nephritis. The etiology could not be determined. Kendall[12] reports a most interesting condition, which he calls "hereditary familial congenital nephritis." Three out of 8 members of the family in one generation, and 8 out of 11 in the next generation, had nephritis. The condition usually appeared at an early age, and was characterized particularly by recurrent attacks of hematuria, sometimes very severe. Some of the cases seemed to be linked with anaphylactic phenomena, as the attacks of hematuria were likely to be brought on by certain specific articles of fruit, such as blackberries and currants.

Kosmak[13] reports a case of nephritis in the newborn, due probably to acute intestinal disturbance. The child was breast-fed, but developed a severe diarrhea a few days after birth, and died two weeks later. At autopsy an acute parenchymatous nephritis was found. Kosmak believes that the intestinal disturbance was caused by an infection of the milk in the milk ducts, and that the nephritis was secondary to this.

Chronic interstitial nephritis, although very rare, may occur in children, giving the same general picture as that of the adult type. It seems to occur more frequently in England than elsewhere, and most of the cases have been reported by Englishmen. An especial characteristic of this type of nephritis is the coexistence of infantilism, and the term "renal infantilism" has been applied to the condition. Barber[14] reports two cases in the same family, in children 12 and 14 years old, respectively. These children showed the characteristic infantilism. Both children were only 4 feet tall, and much underdeveloped in every way—a height of 4 feet would correspond to a child about 8 years old. There was polyuria in both cases, and the urine was of a very low gravity (1003-6), containing a very slight trace of albumin, and a rare cast.

The blood pressure in these two cases was not elevated, nor were the aortic second sounds accentuated. [Rather unusual; usually a high blood pressure.—L. W. H.]

One of the children died in uremia, and at autopsy the kidneys were found to be very small, histologically showing a typical chronic interstitial nephritis. The etiology was obscure.

Naish[15] reports a similar case in a girl 9 years old, who weighed only 32 pounds, and was infantile in every respect. At autopsy both kidneys together weighed only 30 gm. Berkley and Lee[16] report a case in a boy 10 years of age. He was first seen on account of so-called "bilious attacks," in which he had a good deal of dizziness, vomiting, and headache. There was marked albuminuric retinitis. The heart was considerably enlarged, and the aortic second sound was loud and ringing. The systolic blood pressure was 250 and the diastolic 190. The urine was of low gravity (1005) and contained a heavy trace of albumin, and many hyaline and granular casts. Death occurred 3 weeks after leaving the hospital. There was no autopsy. There are, perhaps, between 20 and 30 additional cases of this condition reported in the literature, which would be tedious to enumerate.

Miller and Parsons,[17] in an excellent discussion of "renal infantilism," recognize two distinct groups of cases:

1. Renal infantilism with organic renal disease (chronic interstitial nephritis).
2. Renal infantilism without organic renal disease (diabetes insipidus).

In those cases with organic renal disease the degree of infantilism is variable, but is usually marked. The mental development corresponds to the stature. Polyuria and polydypsia are present, and the urine is of very low specific gravity. It may sometimes contain no albumin, and the only evidence of renal disease shown in the urine may be casts in small numbers. The degree of vascular change varies considerably, and may be all the way from no cardiovascular changes up to marked cardiac hypertrophy and very high blood pressure. The etiology is obscure; syphilis seems to play no part. The condition may be congenital. The prognosis is poor, and death practically always results in a short time.

Cardiovascular System in the Nephritis of Children. Hutinel[1] says that cardiac disturbance is common in acute nephritis, being shown especially by irregularity and dilatation. The blood pressure may be elevated in the acute stage, and usually subsides with the subsidence of the infection.

Baginsky,[17] by clinical methods, could find no evidence of heart hypertrophy in any of his cases of acute nephritis. Friedlander,[18] on the other hand, found evidences of considerable cardiac hypertrophy in a number of cases of scarlatinal acute nephritis that came to autopsy. Wessler,[19] using the fluoroscope, found that there was a distinct cardiac hypertrophy present in all his cases of nephritis, both acute and chronic, and that it often developed as early as two weeks after the onset of the nephritis. Nobécourt[20] reports 12 cases of nephritis in infants, with the following conclusions regarding the state of the cardiovascular apparatus:

1. The blood pressure was elevated in all acute cases.
2. In the chronic cases the pressure was found to be *less* than the pressure in normal children of the same age.
3. In acute nephritis there is likely to be cardiac dilatation, and in chronic cases there may be hypertrophy, or there may not be.

Gordon,[21] from a study of 9 cases, concludes that the blood pressure is usually elevated in both acute and chronic nephritis in children.

As can be seen, there is considerable difference of opinion among the various writers as regards cardiac hypertrophy and increased blood pressure. It is always desirable, in dealing with such a problem, to have data based on a large series of cases, and the trouble has been that not enough cases have been studied to warrant any definite conclusions as regards the blood pressure and the size of the heart in the nephritis of children. Thus, nothing was definitely settled concerning the blood pressure until Berkley and Lee,[22] after an extremely careful study of 93 cases of both acute and chronic nephritis in children between 2 and 12 years, reached the following conclusions:

1. The blood pressure is elevated in the nephritis of childhood, and occasionally to a marked degree. This applies to both acute and chronic nephritis.
2. Systolic and diastolic pressures are not increased to the same extent, the former averaging about 20 mm. Hg., and the latter about 10 mm. above normal.
3. The pulse pressure is increased, but the factor is not constant.
4. The blood pressure in chronic nephritis shows no constant elevation above that in acute nephritis.
5. The blood pressure may, in rare instances, be of prognostic value.
6. No relation has been found to exist between the blood pressure and the urinary findings.
7. Patients having marked edema showed a slightly higher average blood pressure than those with little or none. The difference is not great enough to warrant any definite conclusions.
8. Albuminuric retinitis is probably not common, even in cases showing a marked increase in blood pressure.

Functional Tests. A few years ago the dominant note in the study of nephritis was the histological anatomy of the kidney. At present this is considered very slightly, the main point of interest being the kidney's functional capacity. An immense amount of work has been done, and an enormous literature has developed in the last ten years, dealing with studies in the function of the diseased kidney; most of this work, however, has been done with adults, and very little with children. It is to be expected that the results with children would not coincide with those in adults, as the damage to the kidney is so different.

The phenolphthalein test of kidney function is probably the most valuable single test that there is, and is the one which has been most widely used.

Leopold and Bernhard.[23] in a series of 50 children free from renal disease, found that the phenolphthalein excretion for two hours varied between 50 and 96%, with an average of 70%. These cannot be taken as normal children, however, as many of them were suffering from such conditions as pneumonia or acute endocarditis, in which there might, possibly, have been some kidney insufficiency. Five cases of acute nephritis and five of chronic nephritis were studied. In both the acute and chronic cases the phthalein excretion was diminished. No conclusions can be drawn from a study of such a small series of cases.

In a series of 50 children free from renal disease, the same authors found the following apportionment of the non-protein nitrogenous constituents of the blood. The total non-protein nitrogen varied between 19 and 40 mgm. per 100 cc. of blood, the average being 28 mgm.; the urea nitrogen varied between 8 and 21 mgm., the average being 12 mgm.; the uric acid varied between .6 and 3.2 mgm., the average being 1.8 mgm. The creatinin varied between .5 and 4 mgm., the average being 1.5 mgm. The blood of 16 children with renal conditions was examined. In acute nephritis the non-protein nitrogenous constituents were found to be within normal limits, and in chronic nephritis they were usually increased. [May be considerably increased in acute nephritis; may be normal or increased in chronic.—L. W. H.]

Leopold and Bernhard arrive at the following conclusions:

1. Figures for the non-protein constituents of the blood, as well as for the phthalein excretion of children free from renal disease, are practically identical with the figures obtained from adults, and vary within the normal limits as the adult figures vary.
2. The changes in these figures in children the subjects of renal disease correspond with the changes observed in adults.
3. The importance of the tests for diagnosis and prognosis, amply demonstrated in adults, will in all probability hold true for children, although a more comprehensive series of cases is required definitely to establish this view.

Tileston and Comfort[24] found that the phthalein excretion for normal children varied between 78 and 81%, while the non-protein nitrogen of the blood varied between 22 and 26 mgm. per 100 cc. of blood. They investigated three cases of acute nephritis, the phthalein tests being 39%, 56%, and 54%. The non-protein nitrogen of the blood in these cases was, respectively, 64, 34 and 24 mgm. per 100 cc. blood. They arrive at the following conclusions:

1. "The determination of the total non-protein nitrogen and urea of the blood is of great assistance in the diagnosis of uremia, and as a guide to the treatment of nephritis, a marked increase in these substances indicating actual or impending uremia, and calling for a diet low in protein. In the diagnosis of nephritis it is inferior to other methods, because many cases of nephritis show no retention of nitrogen.
2. The phthalein test is very valuable in the diagnosis of nephritis, showing probably better than any other one method the degree of impairment of renal function. In the diagnosis of uremia and as a guide to diet it is inferior to blood analysis, for a low phthalein output may occur without retention of nitrogen.
3. These investigations of the blood and of the phthalein excretion would appear to indicate a better secreting capacity of the child's kidney as compared with that of the adult.

Another test which has been used extensively with adults is the addition of a known amount of urea or sodium chloride to a diet which has been kept constant from day to day, and determining how much of the added salt or urea is excreted in a given time, usually twenty-four or forty-eight hours. This test has been applied in a few instances to children.

Noeggerath and Zondek[52] investigated six cases of nephritis in children by this method, with varying results; in the severe cases there was retention of salt and nitrogen; in the mild cases none. They believe that these tests are of considerable value in prognosis.

Bosler[26] tried the added salt test, as well as the lactose and potassium iodide tests, on 8 children with nephritis, and concluded that the results and significance of the tests were about the same as for adults.

Nobécourt,[27] following the ideas of his countryman, Widal, emphasizes the importance of salt retention in causing edema, and cites the case of a child, who, while getting rid of edema with no other treatment than a salt-free diet, passed 39 grams of salt in 8 days. He attempts to classify nephritis in children on a chemical basis, again following the teachings of Widal, and recognizes several distinct groups, according to whether the kidney inefficiency is for salt or nitrogen, for neither, or for both.

Kinloch,[28] working particularly with scarlatinal nephritis, concludes that there is a long-continued inefficiency on the part of the kidney to excrete chlorides, and an inefficiency of nitrogen excretion in the acute stages. Cutter and Morse[29] studied two cases of nephritis in children, with especial reference to creatin and creatinin retention, and found that there was none.

Zondek[29] believes that it is impossible sharply to separate salt and nitrogen in considering the functions of the kidney. Each influences the other, and in a given case there may be inability to excrete one of these substances if the other is present in the food in considerable amounts, but if the intake of one is cut down considerably, the excretion of the other proceeds without difficulty.

As a summary it may be said that so little work has been done as regards the functional capacity of the kidneys of children with nephritis, that it is not at all certain that these children can be compared in any way to adults, or that the various tests which have proved of such value in adults will be of so much value in children.

Prognosis. The question of prognosis is, perhaps, the most important and at the same time the most perplexing point to consider.

Ernberg[30] located and examined 40 out of 106 adults who had had acute nephritis before the age of 15 years, mostly in connection with some acute infection, and found normal urines in all. He examined 16 out of 50 adults whose acute nephritis had occurred between the ages of 15 and 30 years, and found that all were normal except 4. Two of these gave evidence of nephritis of recent origin; the other two, whose original attack had been subacute rather than acute, showed albuminuria. He concludes as follows: "If these figures give us a true picture, we certainly have been unduly pessimistic about the prognosis of acute nephritis in childhood."

Apert[31] is not so optimistic; he says: "In infancy and childhood there is great power of compensatory hypertrophy and repair for the kidney. This explains how, in infancy, the renal function may be apparently recovered, giving the appearance of complete cure, and how the kidney, none the less, once injured, is always very delicate, and is likely to be reinjured easily, and to give way at the return of any infection, however slight it may be." Thus it is possible that a good many of the cases of nephritis that we see in adult life may have originated in early life, and the end picture may be the result of the separate attacks of toxins of various acute infections upon a kidney whose power of resistance is already below par.

Hutinel[32] believes that nephritis in children nearly always tends toward recovery, whereas in adults it tends the other way.

Treatment. As regards treatment there is little new. All are agreed that rest and a diet which will throw as little strain on the kidneys as possible is the best treatment. Some writers still advocate the old milk diet, but the majority realize that an exclusive milk diet is not desirable, as it does not furnish enough nourishment, and may contain too much protein for the kidney to handle.

A few men recommend diuretics to increase urinary secretion and get rid of edema, but most writers are agreed that in the acute stages of nephritis, at any rate, diuretics do more harm than good. The French writers, Nobécourt and Hutinel especially, believe in the great efficacy of a salt-free diet in getting rid of edema. The teachings of Martin H. Fischer, that nephritis is due to an acid condition in the kidney, and that large amounts of salt should be given, are not generally accepted by most clinicians.

Hutinel gives a summary of important principles in treatment: "As a résumé let me insist that in dealing with these nephritic children it is especially important to pay attention to careful nursing and hygiene. It is by these measures that the condition is cured, or in the more serious forms that life is prolonged. Use drugs as little as possible. Especially is it important not to irritate the kidney, and to forbid the patient eating any substances whose end-products he cannot eliminate. It is necessary, moreover, to do away with any coexisting infection, however insignificant it may be, and to watch carefully the mouth, digestive tract, respiratory apparatus and skin. In a word, one must remember that the kidney is delicate, and spare it as far as possible."

Edebohls' Operation. The operation of stripping the capsule from the kidneys for the cure or relief of nephritis, first proposed by Edebohls, is discussed by Morse.[33] He reviews 23 cases of nephritis in children in which this operation was done. The end-results of the 23 cases were as follows: "As a result of the operation, two of the cases have been apparently permanently cured, one of them being well and with a normal urine after nine years, and another after eight months. Another was well for two years, and then died of an acute nephritis in no way connected with the previous illness. Two others were well as long as they were under observation, but the time was too short to consider them cured. Nine others have been so much improved by the operation, or, at any rate, the improvement began immediately after the operation, that they have been symptomatically well for months or years, instead of chronic invalids, as they were before the operation. These patients have not, of course, been cured, and will certainly die some time or other of their disease. Nevertheless, the addition of months or years of apparent health seems amply to justify the operation in these cases."

From a study of his own cases and of those which he has collected from the literature, Morse arrives at the following conclusions:

"Edebohls' operation is of much value in properly selected cases of nephritis in childhood. It may save life and result in permanent cure in acute nephritis. No child ill with acute nephritis should be allowed to die, therefore, without giving it the advantage of the chance offered by this operation. It may prolong life for considerable periods in a not inconsiderable number of cases of chronic nephritis, and may, possibly, in rare instances, result in a cure. It should, therefore, always be considered in all cases of chronic nephritis in childhood, which are not doing reasonably well under medical treatment."

REFERENCES.

[1] Hutinel: Med. Press and Circ., N. S., xc, 328-330, 1910.
[2] Kaumheimer: Monatschr. f. Kinderheilk., x, orig., 139-153, 1911.
[3] Phillips: Cleveland Med. Journ., ix, 686-691, 1910.
[4] McLanahan: Pediatrics, N. Y., xxiv, 32-37, 1912.
[5] Loeb: Tr. Am. Laryngol., Rhinol. and Otol. Soc., 146-159, 1910.
[6] Frank: Arch. f. Kinderheilk., lxiii, 202, 1914.
[7] Pribram: Mitt. d. Ges. f. inn. Med. u. Kinderh., No. 14, S. 215, 1913.
[8] Heubner: Jahr. f. Kinderh., lxxvii, No. 1, 1913.
[9] Langstein and Benfey: Med. Klin., No. 23, S. 987, 1914.
[10] Blackman: N. Orl. M. and S. Journ., lxi, 452-456, 1908-9.
[11] Karsner: N. Y. Med. J., lxxxviii, 1076-79, 1908.
[12] Kendall and Hertz: Guy's Hosp. Reports, lxvi, 137-141, 1912.
[13] Kosmak: Bull. Lying-in Hosp., N. Y., v, 190, 1908.
[14] Barber: Brit. Med. Jour., ii, 1204, 1913.
[15] Nash: Brit. Journ. Children's Dis., Bd. 9, s. 337, 1912.
[16] Berkley and Lee: Am. Jour. Dis. Ch., Vol. xiii, No. 4, 1917.
[17] Baginsky: Arch. f. Kinderh., No. 33, 1902.
[18] Friedlander: Arch. f. Anat. und Physiol., 1881.
[19] Wessler: Arch. Int. Med., xiv, 516, 1914.
[20] Nobécourt: Arch. de Méd. des Enf., Par., xii, 881-919, 1909.

[21] Gordon: Arch. Pediatrics, xxviii, 343, 1911.
[22] Berkley and Lee: *Ibid.*
[22] Leopold and Bernhard: Am. Journ. Dis. of Chil., xi, 132-140, 1916.
[24] Tileston and Comfort: Am. Journ. Dis. of Chil., x, 278, 1915.
[25] Noeggerath and Zondek: Münch. med. Woch., lxi, 24, 1914.
[26] Bosler: Ztschr. f. Kinderh., Orig. xi, 346-362, 1914.
[27] Nobécourt: *Ibid.*
[28] Kinloch: Jour. Path. and Bact., Cambridge, xix, 77-101, 1914-15.
[29] Zondek: Zeitschr. f. klin. Med., lxxxii, Nos. 1 and 2, 78-109, 1915.
[30] Ernberg: Nord. Med. Ark., xliv, 109, 1911.
[31] Apert: Bull. Med. Par., xxi, 961-63, 1907.
[32] Hutinel: Med. Press. and Circ., London, N. S., xc, 328-330, 1910.
[33] Morse: Paper not yet published.

Original Articles.

DIAGNOSIS OF FOCAL SEPSIS.*

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That both acute and chronic systemic or localized complaints may result from a pre-existing infectious focus has long been definitely known. The significance of chronic septic foci as an essential causative factor of disease, however, was not fully appreciated until the knowledge of the profession had been enriched by the labors of Miller[1], Rosenow[2], Billings[3] and Hartzell[4]. Indeed, recent advances in this class of affections have caused the profession to view many diseases from a different standpoint.

We are still in great need of higher standards of knowledge of the subject of focal infections, both from the clinical and pathologic aspects. It follows that use is to be made of any and every source of information for diagnostic purposes. The ultimate aim should be to recognize these primary septic foci before the systemic consequences become well established.

In approaching the subject of the diagnosis of primary focal infections, it is to be recollected that in a large percentage of the systemic diseases of which they may be the apparent cause, *e. g.*, chronic nephritis, arterial fibrosis, myocardial degeneration and arthritis—other factors, as heredity, occupation, intemperance in eating and drinking, syphilis, gout and the like, may play an important etiologic rôle. When any of the latter causative agencies are operative in the particular case in hand, it is not possible to determine precisely the significance of an associated chronic infectious focus, more particularly since these may at times remain latent for a long period of time.

On the other hand, it not infrequently happens that a spontaneous cure of the primary focal infection, or that its removal surgically, leads to recovery, hence the recognition of the condition is a matter of the utmost importance.

At the outset, it may not be amiss to mention some of the commoner examples of acute and chronic diseases which are caused by local septic foci. Among the former are generalized tuberculosis, rheumatic fever, endocarditis, pericarditis, myocarditis, septico-pyemia, gonorrheal arthritis, cholecystitis and appendicitis, while the chronic diseases thus produced embrace arthritis deformans, myocarditis, myocardial degeneration, arterial fibrosis, chronic nephritis, septicopyemia and many others.

While, as is well known, the infectious foci, acute or chronic, may occur anywhere in the body, it must not be forgotten that they may be multiple, and under these circumstances may be, at times, classified into primary and secondary; and an attempt to distinguish the former from the latter is always to be made, although this is sometimes impossible.

For example, if the lymph glands of the neck are found to be the seat of a septic focus, we may reasonably infer that the infection has passed from a primary focus elsewhere, *i. e.*, from the tonsils or teeth to these structures, therefore secondary foci occur in this situation, as a rule. The secondary foci exert an aggravating effect upon the clinical features of the condition, hence they assume diagnostic importance and should, whenever possible, be discovered.

It is also of diagnostic advantage to associate the grouping of clinical features in the particular case with chronic septic foci in certain organs. For example, the primary infectious focus in chronic arthritis deformans, acute rheumatic fever, chorea, endocarditis, gastric ulcer, appendicitis, myositis, myocarditis, and glomerulonephritis is usually located in the head, in the guise of tooth-root disease (periapical abscesses), sinusitis and acute or chronic tonsillitis.

In 1887, Mantle[5] first pointed out the relation of the tonsils as a portal of entry to rheumatoid infection,—an observation confirmed by the recent researches of Pointon and Paine.[6] In cases of suspected gonorrheal arthritis, an examination of the genito-urinary tract (posterior urethra, prostate, seminal vesicles, renal and perirenal area, pelvis of the kidney, bladder) should reveal the seat of the focus. Acute miliary tuberculosis points to chronic foci in the lungs or thoracic lymph glands.

Unfortunately, we have not as yet an accurate knowledge of all the sites of septic foci in the body nor of the percentage of the cases in which the disease germs gain admission through these dangerous gateways.

Lane[7] has attempted to fix professional attention upon the abdomen—colonic infection—but as Morris[8] pertinently remarks: "We are not to concentrate our attention upon the colon in searching for focal infections. We must look over the periphery of a large circle of causes in order to find a possible focus which is sending out toxins that are being excreted at a certain point where there is a selective cell affinity for these toxins."

The internist should not neglect to examine the lungs and pleura for the primary focus in obscure septic states, more particularly if the latter are preceded by lobar pneumonia. An abscess may be found either in the lungs or in one of the pleural sacs. The expert gynecologist may discover the initial lesion in the uterus, the tubes, ovaries or glands of Bartholini.

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The clue given by the character of the disease, however, may fail to reveal the primary focus on painstaking, thorough investigation in the supposed location. Frank Billings[9], whose name is inseparably associated with the subject of focal sepsis, pertinently observes: "The failure to find a focus in the expected situation should indicate an extension of the field of examination until it shall have been found."

Goadby[10] aptly states that "in many mouth infections, an exceedingly small local cause may produce suddenly generalized and widespread infection without apparent exacerbation of the mouth-disease preceding such infection."

Says Daland[11]: "The diagnosis of mouth sepsis should be made by a specially skilled dentist, as a rule"; and in his opinion, I , in the main, concur. There are not a few obscure cases in which a consultation between a dentist and physician is to be advised and encouraged. In this connection, Dr. E. F. Everett[12] pertinently remarks: "There remains much to be unearthed in regard to these conditions, which can be accomplished only by the hearty co-operation of one profession with the other."

In suspected cases, the service of the x-ray expert is also required, but no amount of x-ray evidence, taken and considered separately, is ever sufficient for a reliable diagnosis, nor to furnish a basis for treatment. The results obtained by the roentgenologist must be weighed in connection with the bacteriologic findings, anamnesis and the associated symptoms. While bacterial cultures from the gingival surface will usually yield pathologic types of bacteria, they are "not an index of focal infection located in the dental alveoli or tonsils." (Billings).

In these cases and those brought under suspicion by the roentgenologist, the specially skilled dental surgeon should investigate into the pulp canal from apex to the extreme base. Not only so, but the periapical space should be aspirated and the material withdrawn examined microscopically and culturally.

The infected area or alveolar abscess may be entered either through the root canal or by passing over the exposed neck of the tooth involved, after removing the "tartar," and any exudate that may be present, penetrating as deeply as possible. The discovery of one of the salivarian group of streptococci, *e. g.*, the viridans, hemolyticus or mucosus, sets the question of the diagnosis of a septic focus at rest, but does not establish its specific relation to the general infection.

Obviously, if the pathogenic bacteria found in the outlying infected tissues do not differ from those discovered in the local focus, the etiologic connection between the local condition and general disturbances is reasonably well established.

In this connection, the studies of Hartzell and Henrici[13] are of much interest and importance. They state "that the streptococcus viridans is the only organism found constantly in chronic alveolar abscesses and in the great majority is present in pure culture." They have at times found other organisms, particularly the white staphylococci and fusiform bacilli, but they believe that these are secondary invaders and practically devoid of pathogenic action.

These observers continue: "From acute abscesses we have recovered hemolytic streptococci on one or two occasions, but the majority of our cultures, from lesions where free pus occurred, have yielded staphylococci (also hemolytic at times), and the fact that these staphylococci have usually been found associated with the mouth streptococci, together with histological findings in the affected tissues, lead us to believe that many of the acute abscesses indicate a secondary invasion by staphylococci with a suppurative process implanted upon the primarily granulomatous lesion. Occasionally, purulent infections are found where other organisms are apparently the etiologic factor, such as the pneumococcus, diphtheroid bacilli, Bacillus fecalis alkaligenes, Bacillus pyocyaneus, etc.; such infections are not common, nor can they be considered characteristic dental lesions." If future observations by other bacteriologists confirm those of Hartzell and Henrici, the recognition of mouth sepsis will have received a decided impetus. The inoculation of animals with strains of the organisms mentioned above, obtained from the foci, is to be urged, since the general pathology and symptomatology of a particular septic condition may thus be elucidated. Such laboratory demonstrations have been carried out successfully in recent years in connection with a limited number of affections, more particularly acute rheumatic fever and chronic arthritis.

A diagnosis, however, is usually reached by a far easier route by physicians than the foregoing methods would indicate. Unhappily, many practitioners have fallen into the error of making hasty inferences based on inaccurate and superficial observation. This fact can be amply confirmed by the experience of those who have, at the suggestion of the physician or roentgenlogist, removed the primary focus, with the expectation of effecting a cure, but without permanent success.

As elsewhere stated, "Attention cannot be too strongly drawn to the fact that before consulting an expert dentist, in cases in which mouth sepsis is suspected, the physician in charge must, by a process of exclusion, eliminate all foci of infection other than those that may be present in the mouth.

"In these preliminary examinations, the advice of a competent nose and throat specialist is always necessary. Without observing this precaution, either before or after consultation with a skilled dentist, with a report of the results, an unfair advantage is taken of the dental profession."[14]

In cases in which the focus is located in the sinuses and tonsils, the diagnosis of the local condition must be made by a skilled and progressive nose and throat specialist, who should not omit from his studies of the particular case a careful cultural examination of any exudate that may be obtainable from the focus. This method of investigation is to be pursued by the clinician with all thoroughness when primary foci are found in other portions of the body than the head, *e. g.*, the lungs, pleura or gall-bladder.

In some obscure cases of focal sepsis, the diagnosis resolves itself into a bacteriologic study of any vaginal, uterine and urethral discharges (the latter being obtainable at times only by massage of the prostate gland and seminal vesicles), as well as of a microscopic and cultural examination of the feces, sputa, urine, pleural or synovial exudate and even the blood. For example, strains of streptococci, which may invade the walls of the intestines, have been found in the intestinal flora. Furthermore, such focal infections, be they slight or extensive, may, particularly if encapsulated, produce the features of a secondary systemic infection. With these thorough laboratory studies must be combined an equally thorough, general examination, including a careful anamnesis.

I cannot forego an opportunity to urge that great care and caution are required to avoid ascribing to primary focal infections, systemic conditions due to other major causes that may be operative. Neither is the practical fact that a local focus, *e. g.*, a frontal sinusitis, may be secondary to and dependent upon a primary general infection to be overlooked. Such foci may disappear with the subsidence of the systemic features. On the other hand, they may tend to persist and thus become an aggravating cause of, and greatly prolong, the general symptoms.

In concluding, the diagnosis of a primary focus embraces the discrimination of non-focal infections and the establishment of its seat and particular etiologic variety both from a clinical and bacteriologic viewpoint, supported by reliable x-ray findings in many instances, and also expert opinions in the cases of tonsillar and sinus involvement. The fact is to be re-emphasized that x-ray studies should supplement, and not displace, other methods of diagnosis, particularly in cases of mouth sepsis. In the present state of our knowledge, it would appear that the diagnosis of a primary oral focus demands the isolation of the streptococcus viridans.

Lastly, the relation of chronic septic foci to systemic diseases does not as yet stand upon a sure and lasting foundation.

REFERENCES.

[1] Miller: Die Mikroörganismen der Mundhöle. Die Ortlichen und allegemeinen Erkrankungen, welche durch dieselben hervorgerugen werden, Leipzig, 1889.
[2] Rosenow: Phagocytic Immunity and the Therapeutic Injection of Dead Bacteria in Endocarditis. A preliminary report, Jour. A. M. A., Vol. li, No. 19, p. 1571, Nov. 7, 1908.
[3] Billings: Focal Infection.
[4] Hartzell: Journal Lancet, Minneapolis, Feb. 15, 1913.
[5] Mantle: British Medical Journal, 1887, Vol. i, p. 1381.
[6] Poynton and Paine: Osler's "Modern Medicine," 1913, Vol. i, p. 976.
[7] Lane: Consequences and Treatment of Alimentary Toxemia from a Surgical Point of View. British Medical Journal, March 15, 1913.
[8] Morris: Notes on Focal Infections; Transactions Southern Surgical and Gynecological Association, 1915.
[9] Billings: *Loc. cit.*, p. 19.
[10] Goadby: London Practitioner, Jan. 12, 1912, p. 109.
[11] Daland: Focal Sepsis, New York Medical Journal, June 17, 1916.
[12] Everett: The Danger of Systemic Infections from Neglected Alveolar Abscesses, Bulletin of Health, Philadelphia, November, 1916.
[13] Hartzell and Henrici: The Journal of the National Dental Association, May, 1917, p. 477.
[14] Anders: Focal Sepsis, New York Medical Journal, March 10, 1917.

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BRUCK'S SERO-CHEMICAL TEST FOR SYPHILIS: A REPORT OF 400 CASES COMPARED WITH THE WASSERMANN REACTION.*

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and

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This new test for the diagnosis of syphilis by C. Bruck[1] has aroused universal interest. The scientific standing of Bruck and the simplicity of the technic led us to overcome our prejudice, that has been the offspring of the numerous tests that have been offered of late. Bruck states that since the discovery of the complement-fixation test for syphilis by Wassermann, Neisser, and himself in 1906, he has been trying to find a simple chemical reaction that would take the place of the complicated technic of the Wassermann reaction. This method, as he has published it, was worked out and is being used at the front, in the present war, where complete laboratory equipment is not available.

Commencing our experiments with a great deal of skepticism, we were much surprised at the results obtained, which are given below. Whatever may be the final status of the test in the determination of syphilis, we feel that there is a great deal of interest in the fact that this simple chemical reaction does pick out certain differences in the composition of blood sera, and that apparently a large number of syphilitic sera differ in their chemical composition percentage from the majority of non-syphilitic sera.

The technic, while exceedingly simple, offers many chances for errors and individual variations so that we have thought it well to give directions and cautions at some length.

Bruck's[2] technic is described as follows: "The test is made with 0.5 cc. clear serum in a test tube, to which is added 2 cc. of distilled water, and the whole shaken. Then, with a precision pipette, 0.3 cc. of the ac. nitr. purum of the German pharmacopeia is added, and the whole thoroughly shaken and then set aside at room temperature for ten minutes. Then 16 cc. of distilled water at room temperature is added, and closing the tube with the finger, it is shaken up and down three times carefully, not vigorously enough to make it foam. This is repeated ten minutes later, and the tube is then set aside for half an hour. By this time the precipitate is entirely dissolved in the tube with the normal serum, while the syphilitic serum shows a distinct, flocculent turbidity. In two or three hours, or better still, in twelve hours, the gelatinous and characteristic precipitate is piled up on the floor of the test tube."

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* Being Contribution of the Massachusetts Commission on Mental Diseases, Number 191 (1917.11). *Bibliographical Note.* The previous contribution (1917.10) was by H. C. Solomon, entitled "The Behavior of the Wassermann Reaction in Cases Receiving Mixed Treatment," published in *Medicine and Surgery*, May, 1917.

The acid is prepared by diluting the Acidum nitricum of the U. S. P. (Sp. gr. 1.403) with distilled water until the hydrometer shows the specific gravity 1.149, which corresponds to the nitric acid of the German pharmacopeia, but since this requires a special hydrometer, a simpler method is to make a 25% solution of the Acidum nitricum, which will give about the proper specific gravity.

The serum is obtained by allowing 10 cc. of blood to stand at room temperature for an hour, and then centrifuging. Serum that has stood for some time may be used as well as the fresh, and even bloody serum does not seem to confuse the results to any great degree. The serum gives the same results with or without inactivation. Post-mortem blood gave results as constant as that obtained during life, in the few cases that we had in this series. But the reaction may be influenced markedly by the size of the test tubes. We have found that the 13 x 1.9 cm. is the most favorable size.

When one first thinks of this test it appears very simple and probably somewhat crude as a chemical reaction, but there are certain precautions that must be observed, and several hundred normal and syphilitic sera should be tried before the investigator can feel that he has a refined routine technic. There is the personal equation which must be watched, for here is probably the greatest source of error, and readily explains why two different persons get widely varying results with the same sera if they have done only a few dozen tests. We must take it for granted that the reaction is a quantitative one, where some positive reactions may differ only slightly from the normal non-syphilitic, and, furthermore, any normal serum may be made to give a positive reaction, and almost any positive serum be made to give a negative by improper manipulation at some point in the test. There are as many places for error to creep in as there are steps in the process. Bruck has omitted many details in his publication, which allow personal variations, and so we have tried to develop a routine process that will eliminate as many of these as possible.

We shall here attempt to explain the methods which we have found most satisfactory and at the same time indicate the places where error is likely to occur. The 0.5 cc. of serum is added to 2 cc. of distilled water, and shaken thoroughly. Now add slowly exactly 0.3 cc. of acid from a precision pipette, care being taken that it does not flow down the side of the tube. The tube should be shaken gently while the acid is being added, for this prevents the formation of a flocculent precipitate in normal serum which is difficult to dissolve later. After the acid is added shake each tube gently to make sure that these flakes do not persist. It is difficult to shake each tube in exactly the same manner, as must be done if we expect uniform results.

The first 250 tests of this series were made by allowing the tubes to stand for ten minutes as Bruck advocates. Then we found that practically all sera gave a positive reaction if allowed to stand 15-20 minutes, and so in the other tests of the series an attempt was made to make the reaction more sensitive by allowing the tubes to stand only 6-7 minutes. During this time the tubes should be shaken gently once or twice. The manner in which the 16 cc. of water is added also influences the reaction. If allowed to flow freely in upon the precipitate, the positive may be forced into solution as well as the negative. Both pipette and tube should be slanted and the water allowed to flow down the side of the tube without disturbing the precipitate. If all has gone well up to this point, we may see a marked difference between the normal and syphilitic precipitates, in that the normal will begin to go into solution at once, thus clouding the water, while a positive precipitate will be composed of large flakes which show little or no tendency to go into solution or cloud the water above. It must be remembered that the most flocculent positive precipitate will go into solution if the fluid is splashed or shaken too hard while the tube is being inverted. If any doubt as to the character of the precipitate now exists, it may be allowed to stand ten minutes longer, and again inverted as before, or even repeated several times during the next hour or two. We see no reason why the tubes should be left to stand over night, for during this time a precipitate usually settles in the normal tubes. This, however, differs from the syphilitic precipitate in that it is still finely granular and goes back into solution readily when the tubes are inverted.

In view of these possible grounds for error, it is only logical to run controls of known positive and known negative sera along with each group of unknown bloods, and even then certain tubes will seem doubtful, in which event the test should be repeated, with added precaution to see if a definite positive or negative reaction may be obtained.

In the last tests of this series we seemed to aid the reaction by rendering the serum-water solution alkaline by one or two drops of 10% potassium hydroxide before the acid was added.

The positive sera have a larger precipitate, while the normal seem to dissolve more readily.

Plate 1. The Apparatus Necessary for the Test.

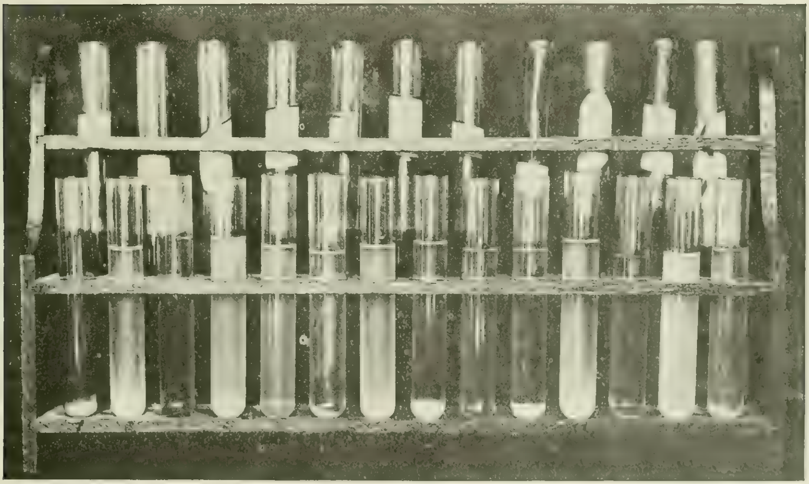

Plate 2. (Read from left to right).

Tubes 1, 8 and 10 show strongly positive precipitates with clear fluid above.
Tubes 2 and 4 strongly positive reactions where tubes were inverted immediately before taking picture
Tubes 3, 9, 12 and 14 show negative sera in clear solution.
Tubes 5 and 13 show negative sera in cloudy solution.
Tubes 6 and 14 show precipitate that may occur in negative sera if allowed to stand over night.
Tubes 7 and 11 show positive sera with clouding above the precipitate.

TABLE I.

SYPHILIS: NERVOUS SYSTEM INVOLVED.

General Paresis:	
Wassermann and Bruck agree positively	47
" " " " negatively ...	7
" " " at variance	10
Tabes Dorsalis:	
Wassermann and Bruck agree positively	3
Cerebrospinal:	
Wassermann and Bruck agree positively	8
" " " " negatively	3
Juvenile Paresis:	
Wassermann and Bruck agree positively	1
Summary:	
Wassermann and Bruck agree positively	59
" " " " negatively ...	10
" " " at variance	10

TABLE II.

SYPHILIS: NERVOUS SYSTEM NOT INVOLVED.

Syphilis:	
Wassermann and Bruck agree positively	12
" " " at variance	5
Congenital Syphilis:	
Wassermann and Bruck agree positively	3
" " " " negatively ...	2
Summary:	
Wassermann and Bruck agree positively	15
" " " " negatively ...	2
" " " at variance	5

TABLE III.

NON-SYPHILITIC: WASSERMANN REACTION NEGATIVE.

Doubtful or positive Bruck.	86
Bruck test negative	216

TOTAL FOR THREE GROUPS.

Wassermann and Bruck agree positively	74
" " " " negatively ...	230
" " " at variance	101

The tests here reported were made on blood sera obtained from patients admitted to the Psychopathic Hospital and its Out-Patient Department. As a routine Wassermann test is made on each patient who enters the hospital, it was only necessary to take another tube of blood from each patient, and the results checked in each instance with the Wassermann reaction As it takes several days to get the report from the Wassermann laboratory of the State Board of Health, there was no chance of being prejudiced by a previous knowledge of the Wassermann reaction. The cases for the most part were those of mental disease; the majority in good general physical health.

A comparison of the total number with the Wassermann reaction shows that there was a general agreement of 304 of the 405 cases tested, or a percentage agreement of practically 75%. In considering the cases of syphilis of the central nervous system in a group by themselves, we find that the agreement is closer, since 69 of the 79 cases tested, or 87%, agreed without any question of doubt. It will be noted that in several cases of general paresis, the Wassermann reaction, which was repeated at intervals, was negative, and in most of these cases the Bruck test was negative also. Our few cases of congenital and latent syphilis also checked very closely with the Wassermann test. In the various groups of mental cases in this series, no factor of interference was discovered. It is also of interest that in the cases where the blood was obtained post-mortem, the Bruck test agreed with the Wassermann result obtained on ante-mortem blood serum. Further work on post-mortem sera will be reported. Some of the patients not included in the syphilitic groups that have a negative Wassermann and no clinical signs of syphilis, give a history of previous infection at some time, which might partly account for the variations in the two tests.

CONCLUSIONS.

1. We present results of the Bruck serochemical test in 405 cases. In 101 of these cases there were definite clinical manifestations of syphilis, in which the Wassermann and Bruck tests agreed positively in 74, or 75%. The two tests agreed negatively in 12 instances, and were at variance in 15.
2. In the group which showed syphilis of the nervous system we had 64 cases of clinically certain general paresis, of which the Wassermann and Bruck tests agreed in 54 instances, or practically 85%. In other forms of central nervous system involvement the agreement was 100% in the 15 cases tested.
3. In the cases with no apparent involvement of the nervous system the agreement was somewhat less, being 76%. This may be in keeping with the fact that the Wassermann test was not so strongly positive in these cases.
4. The advantages of the test are: (1) the short time required to do the test, (2) the limited amount of apparatus necessary, and (3) the simplicity of the technic.
5. The disadvantages of the test seem, for the most part, to be bound up in the personal variations that are apt to occur.
6. We are here dealing, most probably, with a quantitative chemical difference in the protein content of syphilitic and non-syphilitic sera, the nature of which is not understood by us. It is our hope that this may be brought to light in the near future in the field of chemistry.

REFERENCES.

[1] Bruck: Münchener medizinische Wochenschrift, Munich, Jan. 2, 1917, Vol. lxiv, No. 1, p. 25.

[2] Bruck: Journal of American Medical Association, March 24, 1917, Vol. lviii, No. 12, p. 944.

PARESIS OR DEMENTIA PRECOX?*

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THE question of nomenclature must arise from time to time, as our knowledge of disease-processes increases. The question of nomenclature in the psychoses is an especially difficult one, owing to the processes dealt with and owing to the slight amount of knowledge which we possess with regard to the normal functioning of the human mind. More recently this question has been brought to the fore in psychiatry by reason of the advances made possible by the discovery and use of the Wassermann reaction, and it is with this small part of the question of nomenclature that we are concerned in this paper.

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* Read in different form at the Conference on Neurosyphilis and Its Treatment, held at the Grafton State Hospital, Worcester, Mass., Nov. 17, 1916. Title at that meeting "Demonstration of Specimens in a Case of General Paralysis Having Catatonic Symptoms."

The Wassermann reaction, as applied with the blood and spinal fluid in the psychoses, has given mental medicine a decided advantage by showing it the true extent of the syphilitic process. We have come to a fuller realization of the truth of the old statement that paresis can simulate any mental condition. But since the discovery and use of the Wassermann, and with these the discovery of the extent of the inroads of lues, the diagnostician has become careless in his nomenclature. Every case of syphilis of the nervous system is called paresis, in some locations, and even in the most advanced centres we hear of only two sorts of neurosyphilis,—the parenchymatous and the vascular connective-tissue types.

Of course, this is the logical thing to have expected, for we know that the diagnostician is concerned chiefly with treatment and it was felt at first, that the designation "paresis" was sufficient for his purposes. Later the term "syphilis of the central nervous system" was found to state the facts better, and, as the results of treatment and of further anatomical studies appeared, it was found that the division of syphilis of the central nervous system into the parenchymatous and vascular connective-tissue types had a practical bearing for prognostics.

But nowhere do we find an attempt to classify cases as to their psychosis, that is, as to the predominance of one group of mental symptoms as against another. The diagnosis of paresis is now made on the finding of the positive Wassermann reaction in the patient's blood and spinal fluid, together with a pleocytosis and the presence of abnormal chemical constituents in the latter. Of course, I am not taking into consideration the border-line cases here.

It is this attitude of calling all such cases by the above set of titles which should be modified shortly. There are several reasons why this attitude should be changed, not the least of which are theoretical reasons. There are certain practical reasons, chief among which is the question of prognosis. We are told that the vascular connective-tissue types are more amenable to treatment than the parenchymatous types; that we may arrest the process, but that we cannot expect to replace injured or dead nerve cells. This is all doubtless true, but it is theoretically equally true that some nerve cells are more vital to the animal economy than others. And it is this consideration of the groups of nerve cells injured which should also be of value in making the prognosis.

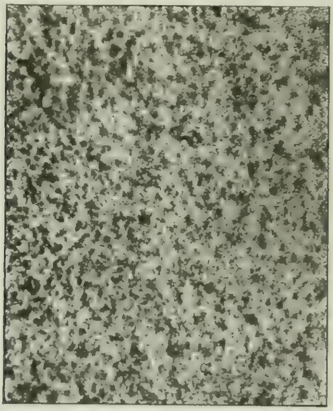
We have some evidence that it is perhaps a question of nerve cells injured rather than one of connective-tissue as against parenchyma, for we know that certain cases show more mental impairment than others, even after the disease-process seems to have been arrested. And we know now that something more than the therapeutic test is essential in order to give the correct prognosis; it being usual to claim that those which improve are the connective-tissue types, and those which do not yield so readily are the parenchymatous types.

The chief question which has been neglected is whether the process is chiefly forward of the Rolandic fissure or behind it, and whether it is chiefly in the cortex or in the fiber pathways in the white matter. We are all aware of the differences in physiology between the pre- and post-Rolandic regions, and I hope that we are all familiar with the significance of these two great regions for psychiatry. May there not be a difference in the vital necessity between the motor needs and the sensory needs of the human organization?

In addition to the practical aid in prognosis which may be offered by a consideration of the brain region affected, I would propose an equally practical reason for such consideration in the aid which it might give the study of dementia precox, which is fast finding its real anatomical foundation. It is felt in certain quarters, for example, that the region affected in the catatonic form of dementia precox is the post-Rolandic. If this is true, is it not conceivable that any process which affects this region to a sufficient degree should give rise to the catatonic syndrome? Is it too much to suppose that the syphilitic process may give rise to the catatonic syndrome, if it affects the post-Rolandic regions severely enough? As a matter of fact, the presence of dementia precox and of paresis in the same individual has been noted long before the Wassermann reaction was discovered, but, at that time, it was thought advisable to consider the two as distinct entities in the same patient. Now we can consider the whole as one process which has involved the groups of cells and fibers which subserve the two mental pictures.

Case W. S. H., No. 28853, was such a case. The patient's mental trouble began at the age of 28 years with an exaggeration of his previous dissolute habits. After about 6 months, he developed auditory hallucinations, thought he was to be killed, became destructive, maniacal, and went out of doors improperly clad. At admission, he talked volubly and quickly, but showed some impairment of memory. He was easily distracted and his flow of thought was rambling. He had high ideas about his ability to sing, and altogether acted in a manic way. He gradually passed into a catatonic state, showing negativism, muscular rigidity, refusal of food, incontinence. Yet physical signs were noted early, their significance not being fully realized, and with the appearance of the positive tests for lues on the blood and spinal fluid, the diagnoisis of paresis was made, though the first diagnosis had been manic-depressive insanity, manic phase, and then dementia precox. The patient finally developed convulsions and died at the age of 30, after a duration of about 2 years of the acute symptoms.

The pathological examination of the brain with the Scharlach-R stain for fat in twenty-four sections from each side of the brain, showed that the chief deposition of fat was in the white matter of the post-Rolandic convolutions. While such a finding in a single case could have little meaning, it assumes great significance when considered in connection with the other facts stated above.



Case W. S. H.—White matter of supramarginal gyrus. Shows enormous amount of fat (black). Scharlach-R stain.

It seems proper, then, that we should call those cases paresis which show the mental picture and the physical signs of paresis, whether they have the positive signs of syphilitic infection or not. It seems equally fitting to me that we should call those cases dementia precox which have the mental and objective signs of dementia precox, regardless of whether they have a syphilitic infection or not. For only in this way can we hope to think and act clearly in the splitting up of the dementia precox group, which seems to be well under way, and only in this way, perhaps, can we solve the question of why certain paretics recover with more dementia than others, why some are less amenable to treatment than others, and, finally, why some have negative findings for lues.

FURTHER OBSERVATIONS ON SHOCK AT THE FRONT.

By W. T. Porter, M.D., Boston.

[From the Laboratory of Comparative Physiology in the Harvard Medical School.]

I.

In my first communication on "Shock at the Front,"[1] I recorded measurements of blood pressure made in the first-line trenches at Nieuport on the Yser. The blood pressure in soldiers on duty there was normal. But at Nieuport there was no offensive, save the habitual bombardment. Fortified perhaps by habit, life under fire had become an uneventful round. It is true that the bomb, the trench torpedo, and the high explosive shell took their daily toll. The spectacle of mangled men stirred pity, but failed to change the even pressure of the blood. It might not be so in a fierce barrage. There, I was told, when drum-fire fills the air with a continuous roar and hillsides smoke under the bursting shells, the arterial pressure sinks, and turns toward shock. Upon the wound, the weakened guard gives way, the pressure falls profoundly, and life is at once in jeopardy. An alluring speculation! Yet long experience has shown that, with regard to the circulation, speculations have no value except as incitements to research; only measurements have real worth.

The Great War does not lack material for such measurements, but admission to the tragedy is difficult. To request an order to proceed to a spot where an attack is being made is of no use. The attack will be over before the order can be issued by the necessary bureaus. It is essential to have authority to pass anywhere on the battle front. On May 20, 1917, I received from the Ministry of War, with the consent of the General commanding the —— army, an order giving me complete freedom of action and specifying that I was to receive every assistance in accomplishing my researches on traumatic shock. A month later this was supplemented by a priceless order from Grand Quartier Général extending these privileges to other armies These magical papers opened every door. I am deeply indebted for them. But I am still more indebted to the consideration and kindliness shown me in the —– and ——armies by men of every rank, from stretcher-bearer to Commanding General.

This is not the place to set forth my adventures. It is enough to say that on May 22 I found myself about 300 metres from the crest of Mont Blond, one of the low summits in the Massif de Moronvillers, a long ridge which commands the plain beyond Chalons-sur-Marne. The strategic importance of this ridge is very great. In April it was still held by the enemy. The French offensive against the Massif began April 16. Owing probably to insufficient artillery preparation, this first attack failed; little or no ground was gained, and the losses were very heavy. One ambulance, of which I knew, prepared for 3000 wounded; they received 18,000. Since that date, the French have won all the ridge except that part above my station. On May 25, the French finished the job. It was a beautiful and interesting operation. I quote from a letter written on my knee during the last hours of the battle:

''My *poste de secours* was dug by the Germans. It consists of a cellar about 8 by 10 feet, and 6 feet deep. The roof is proof against fragments, but not against direct hits.[*] A ladder leads to a cave, 7 by 8 feet, the floor of which is 15 feet below the surface of the ground

''Yesterday afternoon, at three o'clock, the French began to prepare for storming the crest of Mont Blond—the white ridge just before my eyes. In an hour the Germans made up their minds that an assault was intended. The artillery fire, which was continuous before, now swelled to a torrent. Each side placed a barrage. The German barrage covered the little valley behind the crest. We were on the slope nearest the crest. The bottom of the valley was about 150 meters from us, consequently we were within the barrage. Between four o'clock and midnight, more than 10,000 heavy shells fell within a radius of 1000 feet from our cave. I took the count from time to time with my watch. We were driven at once into our deeper refuge. The little stuffy hole was packed with men, knee to knee; stretcher-bearers, surgeons, my orderly, and myself. The three surgeons played baccarat. I sat on the edge of a plank and watched the game. We had an acetylene light. The shells fell all around, shaking the place and repeatedly putting out the light. The noise was remarkable. The air was filled with screams, hisses, and loud reports, followed by the slide of masses of earth. Many shells were so close that a strong push of hot gas was felt. At six o'clock the Moroccans took the ridge by storm. At midnight the bombardment slackened but did not cease. With the dawn the wounded came in a stream. They were laid in the upper room. The wounds were of all sorts. The worst was a completely crushed jaw, in a man with a dozen slighter wounds. One man had a hole through the temple into the brain,—a hole two inches long and half an inch wide. Another had a smashed leg, a bad head, and in the thigh a wound the size of a small orange. I watched the blood pressure carefully. Imagine a cellar with a plank floor covered with clay an eighth of an inch deep. A horrible tub full of bloody dressings. Two stretchers on the floor. Ten men in a space 8 by 10 feet, shoulder to shoulder. Two candles. Sand-bag walls. The roof so low that I am always hitting my helmet against the beams. The air thick with the smell of blood, sweat, alcohol, iodine, vomit. Everywhere a smear of clay—the chalky clay of Champagne. The continuous scream, roar, crash of shells. A rain of small stones, dirt, pieces of steel. Every few seconds a profound trembling, as a shell strikes closer. Four men passing bandages and iodine in the half light, over backs, under arms. The cries of the wounded. The litter of bloody garments. The fresh cases, obliged to lie outside, under the fire, until the room is cleared. The brancardiers, bent under the load of the stretcher, slouching off with the dressed wounded. The dawn, the failing moon, the thick vapors and acrid stench of the barrage. The blasted hillsides smoking under the continual rain of death. Countless fresh shell holes all around us. The graves reopened.

* * *

They are bringing down the dead. They lie sprawling on the slope just below us, half sewed up in burlap, like pieces of spoiled meat.''

In spite of these conditions, of which I have made a faithful report, the blood pressure remained normal, not only in the unwounded men, but also in the wounded. Yet many of the wounds were grave.

My previous observations at Nieuport, at the Mort Homme, and on the Somme, showed that the blood pressure is not lowered under the habitual bombardment. These new observations show: (1) that the blood pressure is not lowered under a barrage fire, said to be as violent as the worst in the great drive at Verdun; and (2) that shock probably is not immediate, but develops some time after the wound.

II.

In a second communication[2] in this Journal, the discovery was recorded that fat embolism is a cause of shock. This discovery was based on my producing typical shock by the injection of olive oil into the jugular vein of animals. It was supported by the known facts: that shock is most frequent after fractures of the femur and after multiple wounds of the subcutaneous fatty tissues; that fat embolism of the brain and other organs has been observed after such wounds; that the injection of oil into the veins is followed by fat embolism.

During the last week of May, 1917, I collected at Mourmelon-le-Petit sufficient observations to support strongly the statement that fat embolism is the principal cause of shock.

Mourmelon-le-Petit is a small village in the plain of Chalons-sur-Marne. It is the seat of an *ambulance de triage*—a sorting station. To this station, which is within shell fire of the German lines, are brought all the wounded from a number of *postes de secours* on the Massif de

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[*] Two days after my departure, a shell entered the poste next mine, killing the two surgeons and five of the stretcher bearers.

Moronvillers. At this *triage*, I saw more than one thousand freshly wounded. Aside from a few abdominal cases, in which there was probably direct injury to the vasomotor nerves of the abdominal vessels, the only shock was that caused by fracture of the femur or by multiple wounds of the subcutaneous tissue—cases in which fat embolism undoubtedly took place.

From June 23 to June 30 I was at Vauxtin, seat of a *triage* behind the Chemin des Dames. Here again were the familiar scenes: the balloons hanging like carrion birds above the heights, the aeroplanes, the fuming barrage, the wrecks of men cast up by the waves of field-grey Germans that beat in vain against these fiery slopes, the stream of ambulances bringing their freight with the regularity of butchers' carts. And here again was the clearest evidence that shock is rarely seen except where fat embolism is known to be present or where the vasomotor nerves of the abdomen are injured.

III.

In a third communication[3] in this JOURNAL, experiments were recorded in which the low blood pressures of shock were raised 15, 20 and even 30 millimeters of mercury by increasing the aspiration of the thorax. When an animal suffering from shock is made to breathe an atmosphere rich in carbon dioxide, the action of the respiratory pump may be doubled or trebled. The blood is sucked from the engorged portal veins into the heart and the arterial pressure is raised.

The following cases of shock, observed at Vauxtin,* illustrate the value of the respiratory treatment in man:

CASE 1. June 25, 7 a.m. Both legs amputated. Diastolic arterial pressure 51 mm. When carbon dioxide was inhaled until the quantity or air entering the chest was about doubled, the diastolic pressure rose to 60 mm. At 11 a.m. the patient was out of danger.

CASE 2. June 26, 8.25 a.m. Two deep wounds in the back. Multiple wounds elsewhere. Diastolic pressure, 53 mm. Inclined position and hot normal saline in vein caused pressure to rise to 70 mm. Operation at 10.15 a.m., lasting a quarter hour. At 10.30 the diastolic pressure was 52 mm. An injection of adrenalin brought it to 57 mm. for a short time only. At 11.05 the pressure was 53 mm. At 11.15 the respiration was deepened by inhaling carbon dioxide; 11.20, diastolic pressure 60 mm.; 11.25, carbon dioxide was stopped and the pressure thereupon fell to 53 mm. At 11.35, the gas was again employed and the pressure rose to 61 mm. This man recovered.

CASE 3. June 29, 6 a.m. Right leg crushed. Many small wounds through subcutaneous fat. Diastolic pressure 47 mm. Injections of normal saline solution in vein at elbow did not raise the pressure. Ether injected under the skin also produced no effect. Increased respiration from inhaling carbon dioxide at once increased the pressure. The pulse, which could scarcely be felt at the wrist, became plainly stronger. At about 11.30 a.m., during carbon dioxide breathing, the leg was amputated under local anesthesia, and the multiple wounds dressed without anesthesia. There was no unfavorable reaction, though under ordinary conditions (without carbon dioxide respiration) the operation would almost certainly have been fatal. Several hours after the operation, this man's femoral pulse and heart action were so good that he was believed out of danger. The carbon dioxide respiration was discontinued. In about ten minutes, the respiration became feeble and the pulse less strong. The carbon dioxide was at once renewed, but the respirations did not become stronger, and in ten minutes more the man was dead, in spite of the carbon dioxide atmosphere. He was from the beginning a case ordinarily called hopeless.

From these cases it appears that increased respiration from the administration of carbon dioxide is of advantage in shock. In my experience it has not failed to raise the blood pressure, even in profound shock.

In the observations at Vauxtin, the head of the wounded man was placed in a wooden box, the length, breadth and height of which were each about 35 cm. The end for the neck was in two pieces. The lower piece was fixed and had a semi-circular opening for the back of the neck. The upper piece was movable. It had a semi-circular opening for the front of the neck. This piece slid down upon the neck like a guillotine. Cotton was placed between the edges of the openings and the skin. A hole of about 2 cm. in diameter was made in each of the two sides of the box. Cotton was placed in these holes to regulate the amount of carbon dioxide and air. The carbon dioxide entered one of these holes. It came from a cylinder provided with a regulating valve. On its way it bubbled through a water bottle. The volume of gas employed was judged by the number of bubbles per minute. Enough gas was used to double the respiration. The patient was in the inclined position, the feet 30 cm. higher than the head.

I believe it would be of advantage to use the carbon dioxide during operations.

Great care should be taken to discontinue the carbon dioxide respiration very gradually.

Carbon dioxide breathing may also be given without any apparatus except the box. In that case, the patient produces his own carbon dioxide.

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* These observations were presented to the Académie des Sciences, July 9, 1917, and appear in the *Comptes rendus* of July 23, 1917.

REFERENCES.

[1] Porter, W. T.: BOSTON MEDICAL AND SURGICAL JOURNAL, Dec. 14, 1916, Vol. clxxv, p. 854.

[2] Porter, W. T.: Fat Embolism a Cause of Shock. BOSTON MEDICAL AND SURGICAL JOURNAL, Feb. 15, 1917, Vol. clxxvi, p. 248.

[3] Porter, W. T.: The Respiratory Pump an Aid in Surgical Shock. BOSTON MEDICAL AND SURGICAL JOURNAL, May 17, 1917, Vol. clxxvi, p. 699.

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THE POSITION OF ANTISEPTICS.

Reports from surgeons at the front show that radical readjustments of their views on antiseptics are constantly being made. Dakin's solution and his Chloramine-T in particular seem to have met with much unfavorable criticism. The objections to their use come under two headings. The first and most important objection is that as prophylactics these preparations have proved highly uncertain. Accordingly, in French army orders published in the *Bulletin et Mémoires de la Société de Chirurgie* of June 19, surgeons are requested not to use hypochlorite powder as a prophylactic in cases of gas gangrene. The rule appears to be based on sound knowledge, for in his investigations Kennety Brown was unable to observe any action of the solution on the gas bacillus. He states that sodium hypochlorite is not specific against this organism. More recently Sir Almroth Wright has said that Dakin's solution possesses little antiseptic power. Similarly, it is averred by the French surgeons, Le Grand and Delbet, that while Dakin's solution reduces the number of flora in wounds, it annihilates the natural defences of the serum. Its action appears to be simply the mechanical washing away of necrosed tissue. They agree with Wright that when this has been done a hypertonic solution of salt is the best application. This mention of salt solutions may not inaptly introduce a brief digression. Their uses and effect have been recognized and taught in American schools for some years. However useful they doubtless are, they are also far from being a novelty.

Recently, various English writers,—Browning, Gulbransen, and Thornton,—have studied the precise antiseptic strength of sodium hypochlorite. They contrast it with brilliant green, one of the group of specific antiseptics. Brilliant green is somewhat less active than acriflavine in the presence of serum, but solutions of 1:2000 were five hundred and seven times more powerful than Dakin's solution against staphylococcus and B. coli respectively (*British Medical Journal,* August 4, 1917). Acriflavine at present is considered one of the most effectual of specific antiseptics, and it has a remarkable selective germicidal effect on almost all organisms, causing their rapid disappearance from wounds. Moreover, the effect of these dyes is increased by the presence of serum, and they are regarded as superior to Dakin's solution when used according to Carrel's method.

A somewhat less important consideration is raised by the question how far the chemical faults of this solution militate against its use. In its preparation it is difficult, if not impossible, to avoid an excess of boric acid, which it is necessary to add in order to keep the solution free from caustic soda, which itself results from the presence of free hypochlorous acid. The effect in application of caustic soda is painful and sometimes irritating. In a later preparation,—p-toluene-sodium-sulphochloramide,—Dakin has endeavored to avoid this fault, but it is likely that by introducing a basic substance into his antiseptic he has lessened its effect in the presence of serum. Daufresne or Dufresne, as some spell it, avoids the use of boric acid, substituting carbonate and bicarbonate of sodium in the solution of chlorinated lime. In this case the liquid contains free caustic soda, which causes injury to the vitality of the tissues. Daufresne's solution requires twelve hours for its preparation and great technical skill. According to a recent writer, E. G. Schlesinger, in the July issue of the *Journal of the Royal Naval Medical Service,* the Dakin-Daufresne solution "aims at securing a solution containing between 0.45 and 0.5% of hypochlorite and devoid of any free caustic soda." Tests of this solution made by Duret and described in the *Journal des Practiciens* do not bear out this belief. He suggests a change, that is, the action of magnesium sulphate on chlorinated lime. This solution, he states, is free from caustic alkali, is stable, and cytophylactic. In a sense this may be true, but practice and laboratory tests indicate that the class of substances which depend for their effect on hypochlorites is precisely the class which must be discounted.

Another property alleged to belong to Dakin's solution seems open to question. According to Schlesinger, it "has the valuable property of rapidly splitting protein into soluble substances." There is clearly no possible answer to this assertion, except a purely theoretical one, having no expression as a chemical formula. In such hypothetical reactions there will doubtless be many possibilities. On this point, A. C. Hollande in *Comptes rendus de l'Académie des Sciences,* 1916, clxii, p. 959, has brought forward some investigations that afford us at least an analogy. On adding basic dyestuffs to blood serum, a copious precipitate is produced, but if an acid dyestuff is used, coagulation of the albumin is prevented. It seems likely that definite compounds between the soluble protein and the dyestuff are formed. But as heat is necessary to this reaction, it becomes hard to understand how it can take place in wounds.

An invaluable insight into the methods of surgeons at the front is provided by the latest reports of the French and German authorities. An abstract of the present German practice, published in the *British Medical Journal*, shows that primary excision and suture is the accepted method of treating wounds. The French have lately emphasized the value of this method, which they say is founded upon the rational one of helping nature in her own methods of cure, which they call the autosterilization of wounds. Removal of the lacerated and necrosed tissue, washing with hypertonic saline, and suture, have yielded the best results. The practical lesson is that the treatment of wounds during transport and afterwards is a question of technic which, if properly done at the right moment, leads to the happiest results without the routine use of antiseptics. And these, when used, are those which are specific against the special flora of the wound. But, with good technic, the flora should be excluded.

THE DRAFTING OF MEDICAL STUDENTS.

In another column of the present issue of the Journal is published a report by the Commitmittee on Hospital and Medical Facilities of the New York Mayor's Committee on National Defense relative to the drafting of hospital internes and medical students. The desirability of such draft has for some weeks been a subject of discussion in medical organizations and periodicals. On August 21, the United States Secretary of War instructed Surgeon-General Gorgas to provide him with figures showing how the operations of the draft law would affect reputable medical schools throughout the country. In this work, Dr. Gorgas was assisted by Dr. William H. Welch and Dr. Victor C. Vaughn, who are special advisors on his staff.

The shortage of hospital internes has already begun to make itself felt. In twenty New York hospitals, 156 members of the staff have already joined the Medical Reserve Corps; and of 218 internes, 178 are of draft age, and 88 have already been accepted. Authorities on medical education in Baltimore, Syracuse, Cincinnati, St. Louis, Cleveland, and Boston have joined with the New York Mayor's Committee to urge the exemption of hospital internes and medical students from the general draft. A communication on this subject from Dr. Heffron of Syracuse to the Chairman of the Senate Committee on Military Affairs elicited the following reply:

> "It seems to me that in the operation of this act some method will be devised by those who are responsible for its execution to utilize to the best advantage the services of those who may be drafted into the service under its terms. If this is not to be the case the whole system would be seriously impaired. Have you ascertained what the War Department proposes to do? Suggestions for changes of the law have not yet reached this committee, so far as I know, but it may be that the Secretary of War has already anticipated the situation you mention. The matter is having my careful attention."

In Chicago similar action against the drafting of medical students has been taken by leading physicians and educators. Statistics show that without exemption the draft would involve the following percentage of students at several large institutions in medical training: Columbia University, 30%; Bellevue Hospital Medical College, 22%; Cornell University, 21%; New York Homeopathic Medical College, 33%; Syracuse University, 29%.

The arguments against the wholesale drafting of hospital internes and medical students for non-professional service in the National Army are obvious to those who regard the national economic value of the training which they possess. These arguments have been most effectively stated in a letter written by Dr. Henry A. Christian of Boston and published in the daily press on August 26:

> "Should students of medicine be drafted as privates? This is a question which is receiving considerable discussion at present. Is this question of any vital importance to you as a citizen of Boston? Let us suppose that medical students will be drafted in the usual way. How would that affect Boston? In the first place such figures as are available indicate that a relatively large proportion of medical students have been called in the first draft. The provost marshal, General Crowder, says that not all of these will be drafted. However, this answer is of no real import. We are preparing now (at least we hope that this is the case) to continue drafts so long as soldiers are needed at the front. This being so, we must think not of the first call, but of the second and of the third, and so on until all physically fit young men, if needed, are called. We must plan, then, as if all physically fit medical students are to be drafted, for it would be neither logical nor fair to deal differently with successive calls to the draft.
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> "If half of the medical students of the country are called in the first and second draft, as reports received from about two-thirds of the medical students of America indicate, it is obvious that medical schools will be depleted and graduates in medicine will be decreased greatly in number unless something is done to prevent it.
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> "The medical students of today are the physicians of the future. As the students are reduced in number, so will the supply of physicians shrink. War demands many medical men. Seven to ten doctors per 1000 soldiers is stated as the requirement of our army. With an army in the field no fewer medical men are needed at home, for the soldier as the healthy young man in the community makes but little demand for medical service so long as he is a civilian. Hence the present would seem a poor time to reduce the supply of physicians.
>
> "The medical student following graduation, spends one or two years as an interne or house officer in the hospitals of the country. Boston's large hospitals must have house officers or close their doors. Already men for such positions are scarce, owing to the demands made by the war and navy departments for such men. If the supply is further reduced by drafting medical students, your hospitals must curtail their work and treat fewer patients in the near future. Furthermore, medical students, while still undergraduates, as part of their medical instruction, do much work in the Boston hospitals under the supervision of the house officers and their teachers on the visiting staff. To decrease by draft the number of medical students would hamper directly hospital work by decreasing the number of available student assistants, and this would be serious to Boston hospitals.
>
> "The average citizens can have but little idea of the important part that medical students and recent graduates play in the daily work of Boston hospitals. If they did, there would go out to Washington an insistent demand that ways be found to maintain the number of medical students. Why should not drafted medical students be detailed to complete their medical studies and then be assigned for duty in army and navy or in civil hospitals, as the demands indicate? We are told that the surgeons-general of the army and navy lack the authority to do this. If so, should not the people demand that the Secretary of War or of the Navy, or the President or Congress, supply such authority at once?
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> "It is not that the medical students have any desire to escape service. It is that they can better serve by completing their medical education. The country desires that provision be made for drafted medical students to complete their medical studies as expeditiously as possible because our armies and our civil population are going to need more and more doctors. Canada, England, France tell us that they made the mistake of depleting their medical schools in the beginning of the war. Can it be that the United States, in a short-sighted policy, is going to repeat this error?"

On August 31, however, the general apprehension on this subject was largely allayed by the news from Washington that President Wilson has issued an order providing that drafted hospital internes and medical students may enlist in the Reserve Corps and be assigned to remain in their positions at home to pursue their duties or studies for the general welfare of the country. The text of this order as forwarded by General Crowder to all state governors, is as follows:

> "First—Hospital internes who are graduates of well-recognized medical schools or medical students in their fourth, third or second year in any well-recognized medical school, who have not been called by a local board, may enlist in

the enlisted Reserve Corps provided for by Section 55 of the National Defense Act, under regulations to be issued by the Surgeon-General, and if they are thereafter called by a local board they may be discharged on proper claim presented on the ground that they are in the military service of the United States.

"Second—A hospital interne who is a graduate of a well-recognized medical school or a medical student in his fourth, third or second year in any well-recognized medical school, who has been called by a local board and physically examined and accepted, and by or in behalf of whom no claim for exemption or discharge is pending, and who has not been ordered to military duty, may apply to the Surgeon-General of the army to be ordered to report at once to a local board for military duty and thus be inducted into the military service of the United States, immediately thereupon to be discharged from the national army for the purpose of enlisting in the enlisted Reserve Corps of the Medical Department.

"With every such request must be enclosed a copy of the order of the local board calling him to report for physical examination (Form 103), and affidavit evidence of the status of the applicant as a medical student or interne, and an engagement to enlist in the enlisted Reserve Corps of the Medical Department.

Upon receipt of such application with the named enclosures, the Surgeon-General will forward the case to the Adjutant-General with his recommendations. Thereupon the Adjutant-General may issue an order to such interne or medical student to report to his local board for military duty on a specified date, in person, or by mail or telegraph, as seems most desirable. This order may issue regardless of the person's order of liability for military service. From and after the date so specified, such person shall be in the military service of the United States. He shall not be sent by the local board to a mobilization camp, but shall remain awaiting the orders of the Adjutant-General of the army. The Adjutant-General may forthwith issue an order discharging such person from the military service for the convenience of the government.

"Three official copies of the discharge order should be sent at once by the Adjutant-General to the local board. Upon receipt of these orders the local board should enter the name of the man discharged on form 164A and forward form 164A, together with two of the certified copies of the order of discharge to the mobilization camp to which it furnishes men. The authorities at the mobilization camp will make the necessary entries to complete form 164A and will thereupon give the local board credit on its net quota for one drafted man."

This action by the President appears satisfactorily to solve for the present, at any rate, this doctor's dilemma in the best interest both of the public and of the profession.

THE CAUSES OF JUVENILE DELINQUENCY.

THE direct relation between delinquency and mental enfeeblement, disease or disorder, is no longer an open question. Indeed, the development of correctional reform—the treatment of the delinquent or other anti-social elements of society—is being carried on principally on this basis. The fact that the delinquent is unable to keep the pace in the general social struggle, and must choose these paths of least resistance, is in itself clear indication that he is in some manner below par. Examinations of various custodial institutions for delinquents has brought to light the fact that a very large proportion of them are feeble-minded or mentally disordered, beyond any doubt, and that a still greater proportion of them are below par physically. The delinquent class is continually being recruited from the ranks of the mentally retarded school child, whose condition is not recognized, or, if recognized, is not provided for. An intensive study of the mental condition of school children of certain communities carried out by the Public Health Service showed that over 9% of the school children examined were definitely retarded, and that of these 28% and over showed definite physical retardation (Public Health Reports, Nov. 17, 1916, and Bulletin No. 77). In many, physical defects and sensory disturbances, easily corrected, are the patent causes of much of the mental retardation. The mentally retarded school child is a positive handicap, and even a danger to the normal child, just as the delinquent is a handicap and a danger to the society in which he lives. In both instances segregation and appropriate training are the only rational treatment. The periodic mental, as well as physical, examination of the school child, and the attachment of trained psychiatrists to the general and, especially, the juvenile courts and custodial institutions, would furnish the material for segregation and training. The endeavors of Healy in the juvenile courts of Chicago have demonstrated the value of this sort of work.

And yet, while defective heredity—mental and physical defect—is so important a factor in delinquency, it is far from being the sole cause. Much of the delinquency of childhood, at least, is due to defective or vicious environment as well as the lack of proper parental or communal supervision. It has recently been shown that juvenile delinquency has risen over 40% in London and over 65% in Munich since the war. This sudden rise cannot, of course, be due to any hereditary or personal change in the younger element, but must be due to the family and general social disorganization incident to war conditions. The proper development of the child during war is a vital problem in national conservation, since it is this younger element which must officiate largely in reconstruction. Every scheme for national preparedness must consider the care and training of the child during war stress. Whether the adverse effects of war—shock, injury, sacrifice, etc.—will have an adverse hereditary influence upon the succeeding generations, or whether there is to be a renaissance as a result of the sacrifices and hardships of war, remains to be seen.

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SHOCK AT THE FRONT.

In another column of this issue of the Journal (page 326), is published the fourth of Dr. W. T. Porter's remarkably interesting and valuable series of papers on shock. The three previous papers, which have appeared in the Journal during the past nine months, have dealt respectively with surgical shock as observed at the European battle-front; with fat embolism as a cause of shock; and with certain therapeutic measures which may be employed to counteract shock. Dr. Porter's theories of shock and its treatment, based on his original clinical observations and developed by the experimental method, are now being tested and elaborated in action. His peculiarly vivid and graphic descriptive style makes this fourth paper, from the literary as well as the scientific standpoint, one of the most notable and important medical contributions which the war has yet produced.

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MEDICAL NOTES.

Diphtheria in Newport.—The quarantine placed on the Naval Reserves' Camp and Fort Adams in Newport, was lifted on August 15, as no new cases had been reported there and the number of new cases in the city had begun to decrease rapidly. The disease did not make its appearance at the naval station and only a few light cases were reported at the harbor forts.

Medical Society Meeting.—The Medical Society of the Missouri Valley will hold its thirtieth annual meeting in Lincoln, Neb., on September 20 and 21. Representatives of the Army, Navy, and Public Health Service will address the meeting on the general topic of "How Can the Medical Man Best Serve His Country?"

Tuberculosis as Revealed by Draft Tests.—The National Association for the Study and Prevention of Tuberculosis is preparing to take up the care of the thousands of cases of tuberculosis brought to light by the examination of men who have been selected by draft and rejected for their disability. Dr. H. A. Pattison of Rockford, Ill., has been appointed a new medical field secretary to organize preventive work in military camps and to endeavor to get lists of men rejected on account of tuberculosis.

WAR NOTES.

Military Orthopedics.—It is announced that Surgeon-General Gorgas has appointed Dr. Elliott G. Brackett of the Army Medical Reserve Corps to be director of a newly created Department of Military Orthopedics, which will have charge of the treatment of deformities in soldiers resulting from wounds. It is expected that a large per cent. of disabilities among troops will be cured or overcome because of this special treatment. The Department of Military Orthopedics in France will be in charge of Major Joel E. Goldthwait.

Report of Major Goldthwait.—The return of Major Joel E. Goldthwait from a tour of inspection of French and English orthopedic hospitals has brought to the organization of orthopedic work, both in this country and with the American troops abroad, the benefit of the experience of those countries in re-educating and restoring, either to military or to civil life, the crippled and deformed soldier. It is reckoned that orthopedic methods of treatment have restored 30% of the men in the allied countries, and in Canada the claim is a saving 70% of the wounded men. Major Goldthwait states that:

"A good many of the men shot through the body or the head die; those whose legs, feet or hands are injured are among the orthopedic cases. A great many of these would be crippled for life unless you did something for them by giving them this special orthopedic treatment that has been so wonderfully worked out.

"Just to show the results accomplished, I may mention that from one hospital, where there were 1350 men under treatment, 1000 of them were sent back into the army. In other words, this special form of treatment made that 1000 well enough to return to active service. And the same thing is happening to 70% of men injured in the Canadian armies."

The members of the unit which accompanied Major Goldthwait abroad are now in the British Isles, working in various hospitals studying English methods. The British War Office would welcome the services of more of these American orthopedic surgeons.

New York's First War Hospital.—The National League for Women's Service has opened the first war hospital in New York for the care of the men training at a nearby military camp. The hospital occupies an old residence at Tarrytown, and will obviate the necessity of sending sick men to a hospital at Ossining, as formerly.

Medical Aid for Rejected Men.—The State Guard of Massachusetts has, through its medical department, put forward a plan to provide free medical attendance for men who have been rejected as recruits because of remediable physical defects. Governor McCall, following a conference at the State House, wrote officially to Major General Butler Ames, in command of the State Guard, requesting that the surgical staff of the State Guard offer its services to try to make these men qualified to pass the physical examination. The plan, which has the unqualified approval of Major General Ames, provides that men who have been rejected shall apply at the recruiting station, where their rejection is filed, and will be given a card stating the grounds of the rejection. On the presentation of this card to the State medical officer at the State House, the men will be directed to the surgeon or physician best fitted to handle each case. Among the physicians who have volunteered their services for this work are: Donald V. Baker, Brookline; Harold G. Giddings, Allston; Edward A. Supple, Boston; George W. Morse, Boston; Benjamin E. Sibley, Brookline; Russell F. Sheldon, Boston; Lemuel F. Woodward, Worcester; Charles E. Durant, Haverhill; Thomas B. Smith, Lowell; Ralph H. Seelye, Salem; P. Truesdale, Fall River; Hugh Williams, Garry De N. Hough, New Bedford; J. J. Egan and Franklin H. Thompson, Fitchburg; John W. Dewis, Thomas F. Harrington, George F. Hunt, O. C. Blair, D. S. Willcox, George L. Tobey, Kurt H. Thoma, Ralph D. Leonard, Robert C. Loring, P. Somers Smyth, W. Russell MacAusland, Boston; C. L. Overlander and Francis H. Slack, Brookline.

Care of French Infants.—The American Red Cross has sent a medical unit to France on behalf of French infants. The unit is financed by Mrs. William Lowell Putnam of Boston, and is made up of pediatrists. Dr. William P. Lucas of the University of California is in charge. Dr. J. Morris Slemons of the Yale Medical School is a member of the unit. The work of the unit will be confined to parental hygiene and the scientific feeding and care of French babies.

Military Hospitals.—The thirty-two new hospitals which are being built by the medical corps of the army for the care of the National Guard and National Army camps will cost about $14,500,000. The aim of the medical department is to have hospital provision for 5% of the enlisted force by fall, and then extend it to 10%. Abroad, facilities for 20% of the American expeditionary forces will be available. Provision will be made at the cantonments in this country for 3% of the troops in each camp. It is a well-known fact that the percentage of sickness among men under military discipline is very much less than in civil life, even though the sick list of a military camp includes cases which in civil life would not be regarded as at all serious.

At the cantonments in this country, hospitals will be built capable of caring for 3% of the troops in each camp. Each hospital with the space reserved for extensions will require sixty acres. The buildings will be 24 feet wide, the length varying to meet the needs. A ward about 157 feet long will accommodate 32 beds. A cantonment hospital on a basis of 1000 beds will include about 70 buildings, if each ward is considered as a building. Adequate laboratory facilities will also be provided, and plans are being made to appoint permanently to the staffs of the hospitals, men especially trained to do laboratory work in order that careful tests may be made of each and every soldier for tuberculosis, intestinal infections, and all other infectious diseases.

War Relief Funds.—On Sept. 1, the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$246,648.87
Armenian Fund	223,959.47
Children's Fund	214,116.00
Surgical Dressings Fund	122,296.50
Polish Fund	81,476.95
Italian Fund	44,132.72
French Blind Fund	3,467.00
War Dogs' Fund	1,100.75

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—The total number of deaths reported during the week ending August 25, 1917, is 194, against 238 the corresponding week last year, making a death rate of 13.10. Non-resident deaths, 36.

The total number of cases of communicable diseases reported is as follows: diphtheria, 61; scarlet fever, 7; typhoid fever, 9; measles, 31; tuberculosis, 52. Included in these totals are the following non-residents: diphtheria, 8; scarlet fever, 4; typhoid fever, 2; tuberculosis, 3.

The total number of deaths from communicable diseases is as follows: diphtheria, 5; measles, 4; tuberculosis, 22. Included in these are the following non-residents: measles, 1; tuberculosis, 3.

Typhoid Fever in Gardner, Mass.—On August 20 and 21 twenty-two cases of typhoid fever were reported in the town of Gardner. The health authorities direct their suspicions to a contaminated milk supply. Most of the cases are confined to one section of the town.

Renovation of Hospital.—The Massachusetts Women's Hospital, Roxbury, has closed for a short time in order to make extensive alterations in the interior of the hospital. A new operating room will be built and equipped, an elevator installed, and a ward of six beds will be added. When the hospital opens, about September 15, a new administrative force has been appointed to take charge.

Framingham Health Station.—The experimental community health station at Framingham, Mass., has maintained through the summer a camp for children under sized and under weight, and will continue the camp into September. It will admit mothers and younger children. In the past it has admitted only boys and girls between five and twelve years of age. Dr. Donald B. Armstrong, the executive officer of the health station, is urging the school committee to establish a dental, nose and throat and eye clinic for school children.

Social Service Established at City Hospital.—The social service department of the Boston City Hospital, organized and supported for two years and a half by a committee of interested women, has at last succeeded in demonstrating its usefulness to the institution to a degree warranting its being included as a recognized department of the hospital and of being supported by the City. A small sum of money, which will pay the salaries of five of the eleven workers of the department, has been appropriated, and on the strength of this assistance the committee is planning to raise funds sufficient to carry on the work to a greater extent than has before been attempted. The small force last year, under the leadership of Miss Gertrude L. Farmer, cared for 1462 patients and made 2588 visits.

In view of what has already been accomplished, and of what must of necessity be undertaken, the committee is confident of the continued financial support, not only of its friends, but of the citizens of Boston. Mrs. Paul Thorndike is chairman of the group of women who organized the work. The other members of the committee are: Mrs. Henry Andrews, Mrs. E. H. Bradford, Mrs. Carlo Buonamici, Mrs. H. L. Burrell, Mrs. C. A. Coolidge, Mrs. Harvey Cushing, Mrs. Thomas M. Devlin, Mrs. Henry Ehrlich, Mrs. Reid Hunt, Mrs. Colin W. McDonald, Mrs. G. H. Monks, Miss Mary Morton, Mrs. I. A. Ratshesky, Mrs. Milton J. Rosenau, and Mrs. E. B. Young.

Hospital Bequests.—By the will of the late Ellen F. Ferguson of Brookline, the Addison Gilbert Hospital of Gloucester will receive a fund of $5000, upon the death of a beneficiary, to be used for free beds.

By the will of the late Judge John C. Kennedy of Newton the sum of $3000 has been left to the Newton Hospital.

Poliomyelitis in Haverhill, Mass.—On August 14 the total number of cases of infantile paralysis reported in Haverhill had reached twenty-five.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

District Correspondents.

Berkshire, A. P. Merrill, M.D., Pittsfield.
Bristol North, Arthur R. Crandell, M.D., Taunton.
Bristol South, Edwin D. Gardner, M.D., New Bedford.
Essex North, T. N. Stone, M.D., Haverhill.
Essex South, H. P. Bennett, M.D., Lynn.
Hampden, Laurence D. Chapin, M.D., Springfield.
Hampshire, E. E. Thomas, M.D., Northampton.

Essex South District Medical Society.—Dr. P. P. Johnson, of Beverly, Captain in the M. R. C., is at Fort Benjamin Harrison.

Dr. H. E. Sears of Beverly, Captain in the M. R. C., is at Fort Ethan Allen.

Dr. W. G. Stickney of Beverly, Lieutenant in the M. R. C., has been ordered to Camp Devens at Ayer.

Ralph E. Stone, M.D., *Reporter.*

Obituaries.

FOUR EMINENT EUROPEAN MEN OF SCIENCE.

There have died within the past year in Europe four eminent men of science, natives of England, of Germany, and of Bohemia, whose loss to the scientific world is perhaps even greater than any other which has befallen it as a result of the present war. Though the fields of their activity were diverse, their lives, devoted to medical pursuits, have borne a certain underlying resemblance, and their death within a short period of time makes it appropriate that they should be considered in a common obituary notice.

SIR VICTOR HORSLEY, M.B., B.S., F.R.C.S., F.R.S.

Sir Victor Horsley, a celebrated British surgeon, best known for his work on brain surgery, died of sunstroke in Mesopotamia on July 16, 1916, while serving there as consulting surgeon to the British Expeditionary Forces.

Victor Alexander Haven Horsley was born at Kensington, London, in 1857, the son of an artist. After a course of brilliant scholarship at the University College Hospital, London, he received the degrees of M.B. and B.S. in 1881, with a university scholarship and gold medal in surgery. In 1883 he became a fellow of the Royal College of Surgeons of England, and in 1884 superintendent of the Brown Institution, where he began an elaborate series of experiments on myxedema, which led to the demonstration of the nature of this disease as a phenomenon of thyroid deficiency. In 1885 he was appointed assistant surgeon to the University College Hospital, in 1886 surgeon to the National Hospital for Paralysis and Epilepsy, and in 1893 full surgeon to the University College Hospital and professor of pathology at University College. In 1902 he received the honor of knighthood; in 1906 he retired as emeritus professor of clinical surgery and consulting surgeon to the University College Hospital. In 1911 he received the first award of the Lannelongue International Prize in Surgery. He had also received the honorary degree of M.D. from the University of Halle, Germany.

From the beginning of his professional career, Horsley's interest was primarily in the physiology, pathology and surgery of the nervous system, and his early exploits in cranial surgery established that field as a specialty. He was an extensive writer on all aspects of his chosen line of work, and at the same time he carried on the busy life of a surgical practitioner and laboratory investigator. He was one of the pioneers in cerebral localization, and demonstrated the similarity of cortical areas in the rhesus monkey and in man. He investigated the upper conduction lines in the spinal cord. He explored the region of the thalamus and the subject of cerebellar function as studied by electrical stimulation. He was an ardent defender of the legitimacy of animal experimentation, and his unquestioned integrity and highmindedness were of the greatest value in the defense of medical science against its assailants in England. Horsley was also a pioneer in surgery, and his early exploits in the operative cure of intracranial tumors placed him immediately in the foremost rank of his profession. His eager and ardent personality and his natural adroitness at finesse made him particularly fitted for swift and successful surgery of the most delicate type.

At the outbreak of the European War in 1914, Sir Victor Horsley volunteered his professional services to his country, and after holding various administrative posts in England, was sent early in 1916, to Egypt and later to Mesopotamia. The story of the last months of his life under the arduous conditions of service to which he was there subjected, are well told in obituary notices which have appeared of him in the *Lancet*, and formed a fitting chapter of conclusion to his life of brilliant and distinguished service. A fellow officer, who served with Sir Victor in Egypt during the last phases of his strenuous career, writes of him in part as follows:

"Soon after his arrival in Egypt he was given an appointment more in keeping with his professional position and was made consulting surgeon to the Forces. Before this, however, he had done an immense amount of valuable work in assisting to organize the surgical side of the base hospital to which he was originally attached. As a consulting surgeon he did splendid work; he devoted with unsparing zeal both time and energy to finding out and correcting, as far as lay in his power, any defects of equipment or mistakes in organization in the hospitals, and in the early days in Egypt there were many of these. He was always ready to help with his advice and example those of us who asked him to do so, and in the midst of the most trying circumstances he never lost his cheeriness or good temper. In spite of all the calls upon him, he found time to carry out some original work in connection with the infection of head wounds, and it was entirely owing to his teaching and example that the results of the operative treatment of these injuries, at any rate in one of the hospitals, were so extremely good. His energy and devotion to his work were the more striking because it was obvious that the atmosphere of a military hospital was not very congenial to him, and when we remember his force of character and independence this is not to be wondered at. The amount of work he got through in Egypt undoubtedly tried his strength, and he could not be persuaded to rest to the extent that was really necessary, especially in the hot weather. A tour of inspection which he paid to the Peninsula did him good in this respect, but the many muddles and deficiencies which he found there must have had a depressing effect upon his spirits. He volunteered for duty in Mesopotamia without any thought for himself, and I am sure that he went there in the hope that he might be able to do something to remedy the defects in the medical arrangements which are now so notorious. If he expended, as I am sure he did, all his strength and energy on this work, it is little wonder that he should have succumbed to the effects of that most trying climate. Victor Horsley's was a most charming personality and he was a great favorite in our mess. His death leaves a blank in the branch of surgery, which his genius had played so large a part in founding, that at the present there is no one fitted to fill."

Another letter from a physician at Amara tells as follows of the more immediate circumstances of Sir Victor's death:

"I have just been to the Rawal Pindi Hospital, where Sir Victor Horsley was lying ill, to find that he passed away a few minutes ago—at 8.45 p.m.

He had only three days ago returned to Amara from the front and seemed to be in his usual health and spirits. Only yesterday (Saturday morning) I had some conversation with him on a subject which was interesting him—the provision of hospitals with laboratories; and he then set out to walk back to his camp, which was about a mile and a half away across the Tigris bridge and over the open plain. The shade temperature was over 110° and the atmosphere humid. When he got to his tent he heard there was a sick officer he knew, about half a mile further on; he went on to see him and examined him carefully. He complained of headache later in the afternoon and was admitted to the Rawal Pindi Hospital on Saturday evening, about seven o'clock. His temperature rose, he had a rather restless night, and in the morning seemed worse. His temperature rose all day and finally reached nearly 110° F. He became comatose in the afternoon and passed away after little more than twenty-four hours' illness. The cause of death appeared to be heat-stroke, a condition which carries off many people nowadays in Mesopotamia.

The news of his death has been received with the greatest sorrow and regret, even in these days, when the loss of friends is almost our daily portion, and it will be a large and representative following he will have to his last resting place tomorrow in the Amara Cemetery.

It would ill become one who has only known him personally within the last few months to write of his many and great achievements in the past, but I can speak of his untiring energy and the loyal devotion and singleness of purpose shown in his every action up to but a few hours ago. Those who have met him recently are aware that he had framed a very severe indictment against those he believed were responsible for the mismanagement which he thought characterized some aspects of the campaign. It is only three days since he returned from the front, and he was about to return to India for a spell to prepare his report.

He has been urged time and time again to curb his extraordinary energy and not to put too severe a strain on his physical capacity, but it appears that he underestimated the baneful effects of the severe climatic conditions existing just now in Mesopotamia. It would have been easy for him to have pleaded the heat or his increasing years, but he refused to take things easily, and has sacrificed himself to his zeal for bettering the conditions of others."

In personal appearance and manner of speech, Sir Victor Horsley bore a striking resemblance to Professor George Herbert Palmer. In 1913, as president of the Surgical Section of the International Medical Congress at London he became known to many of the younger American surgeons who had not previously had the privilege of his acquaintance. His courtesy as a presiding officer, his unfailing consideration of others, his swiftness and keenness of mental perception, his unerring instinct for truth, impressed all who saw or met him as manifestations of a character that represented the finest type of professional and personal quality. Sir Victor Horsley is survived by his widow, one daughter and two sons.

SIR THOMAS LAUDER BRUNTON, Bt., M.D., C.M., D.Sc., LL.D., F.R.C.P., F.R.S.

Dr. Sir Thomas Lauder Brunton, who died on September 16, 1916, in London, was born at Bowdoin, Roxburghshire, Scotland, on March 14, 1844. After a brilliant undergraduate career at Edinburgh, he obtained the degrees of M.D., and C.M. from that University in 1866, that of B.Sc. in 1867, that of M.D. in 1868, and that of D.Sc. in 1870. After serving as house physician at the Edinburgh Royal Infirmary, he studied abroad at Vienna, Berlin, Leipzig and Amsterdam. Finally settling in London, he became a member of the Royal College of Physicians, and in 1874 was elected to the Royal Society in recognition of his work on the physiology of digestion and secretion, on the chemical composition of the blood, and on the action of digitalis and mercury. In 1870, Brunton was appointed lecturer on materia medica and pharmacology, and in 1875 was appointed assistant physician to St. Bartholomew's Hospital. During the succeeding years at this institution he pursued the brilliant course of clinical and scientific research, whose results are recorded in his numerous publications. In 1885 appeared his well-known handbook of pharmacology, materia medica and therapeutics, and in 1886 a volume on disorders of digestion. He delivered many lectures before the Royal College of Physicians, and in 1894 was its Harveian orator. In 1897 Dr. Brunton became full physician at St. Bartholomew's Hospital and consulting physician in 1904. He received the honor of knighthood in 1900, and was made a baronet in 1909, and received the honorary degree of LL.D. from the Universities of Aberdeen and of Edinburgh. He was a member of many British medical and scientific societies, a foreign honorary member of the American Academy of Arts and Sciences, correspondent of the Philadelphia Academy of Medical Science, associate fellow of the Philadelphia College of Physicians, corresponding member of the Therapeutical Society of Paris and honorary member of the American Therapeutic Society and of the Imperial Military Academy of Petrograd. He is survived by two daughters and one son, who succeeds to his title, his second son having been killed in the war.

Of Brunton's work as a teacher, his obituary notice in the *Lancet* speaks as follows:

"As a lecturer he met with complete and well-deserved success, both at his medical school and on more public or official occasions. It will be observed that his best books were the outcome of collected lectures, and those that are not so, where they are not merely popular disquisitions, conformed to the lecture style. He was always able to make his subject interesting and easy to follow, and yet he was very thorough, while he would illustrate his points, whether simple or complex, by example, experiment, or anecdote. Punctuality with him was a watchword, and simultaneously with the hand of the clock pointing to the lecture hour the figure of Brunton appeared at the door of the theatre, and almost before he had arrived at the demonstration table he had completed a rapid summary of the previous lecture, so that his audience might be able to follow his thread."

Of his extra-professional character, this obituary further speaks as follows:

"Outside his purely professional work, the outstanding features of Brunton's life were his great generosity and his practical sympathy with pain. The congenial kindly manner which endeared him greatly to his patients was a true indication of his almost emotional feeling for the suffering of others. No one more bounteous with his time, thought, or money, whether to individual friends or for the public good, ever adorned the medical profession. All schemes in favor of national health, of school hygiene, or of military training had in him a stalwart advocate, and in this last connection his close familiarity with the continent and the German professional world long ago led him to believe, and to say, that war between England and Germany was inevitable."

PROFESSOR ALBERT NEISSER, M.D.

Dr. Albert Neisser, who died on July 30, 1916, at Breslau, Germany, was born near that city in 1855, the son of a distinguished physician, Dr. Moritz Neisser. He studied medicine at the Universities of Breslau and Erlangen and received the degree of M.D. in 1877 for a thesis on echinococcus disease. He immediately became attached to the Breslau University Hospital and Polyclinic for Syphilis and Diseases of the Skin, as assistant to Dr. Oskar Simon. It was here, in 1879, that he made his most famous discovery of the diplococcus which has since borne his name. Upon Simon's death in 1882, Neisser was promoted to his professorship, which he retained until his death. Though his name is chiefly associated with the gonococcus, he made notable researches in other fields, especially in dermatology, bacteriology, serology, and syphilography. In 1902 he founded the Deutsche Gesellschaft zür Bekämpfung der Geschlechtskrankheiten. In 1905 he spent several months on an expedition in Java to study the phenomena of syphilis inoculated in monkeys. It was on the basis of his researches that the details of Wassermann's reaction were developed. Dr. Neisser also traveled in Norway and Spain to study leprosy. It was during his absence from Germany that the spirocheta pallida was discovered by Schaudinn and Hoffmann, whose observations were communicated to Neisser in Java and speedily confirmed by him. Dr. Neisser was a brilliant investigator and teacher, and his death, from diabetes complicated by nephrolithiasis, removes one of the most famous and familiar of the older generation of German scientists.

VINCENZ CZERNY, M.D.

Dr. Vincenz Czerny, who died last November, was born in Bohemia in 1842, the son of a pharmacist. He early evinced a fondness for natural history and was sent to the University of Prague and educated as a biologist. In 1867 he was appointed surgical assistant to Billroth, and gradually relinquished his histologic laboratory pursuits for those of clinical surgery. In 1871 he was appointed professor of surgery at Freiburg, and in 1877 was translated thence to the surgical chair at Heidelberg, where he remained until his death. He was president of the German Surgical Society in 1901, of the International Surgical Society in 1908, and in 1910 became honorary president of the International Society for the Study of Cancer. He was the founder of the Cancer Institute at Heidelberg. In its editorial obituary of him, the *Lancet* speaks as follows of his contributions to medical literature, of his personal character, and of his service as a teacher.:

"Possessed of a ready pen and incisive style, and the author of 150 or more short practical papers, Czerny never wrote a systematic treatise, and his name, although associated with the first vaginal extirpation of the uterus and with cancer research in general, is known only to the specialist in connection with numberless improvements in operative methods. His intestinal suture is, of course, in every student's text-book. As a teacher, Czerny fully recognized the value of *können* over *wissen*, and worked for the revision of the German medical curriculum on practical lines. In so doing he held up English and American methods as worthy of imitation, as well as the effect of our General Medical Council in standardizing medical education. In his intimate association with his staff and hospital patients Czerny showed a warm human sympathy which will make his loss acutely felt and his place hard to fill."

Miscellany.

THE DRAFTING OF MEDICAL STUDENTS.

Unless the War Department speedily announces a program for such disposition of drafted hospital internes and medical students as will meet the needs of the army and of the civil population, an appeal will be made to Congress for appropriate legislation. The urgency of the situation has again been brought to the notice of President Wilson and Secretary Baker, and it is hoped that an executive order to relieve the situation will be issued within the next forty-eight hours. Longer than this, the medical educational authorities and the numerous civic bodies which have been demanding action are not likely to wait.

The Mayor's Committee on Hospital and Medical Facilities has been in communication with members of the Committees on Military Affairs of both the Senate and House of Representatives, and has assurances that the situation is understood by the members of those committees.

The Medical Section of the New York State Branch of the Council of National Defense was notified on Monday afternoon that "the military authorities have asked for a definite statement of the number of third- and fourth-year medical students who have been actually accepted for service, and though no promise has been given, there is reason for hope that these men may be allowed to continue their studies. The General Committee has not altered its views as to the desirability of having all medical students continue their technical training.

The contention of the Provost Marshal General that the draft would not make serious inroads on the medical schools, is refuted by returns received directly from twenty medical colleges. The following figures, showing the proportion of medical students drafted and accepted under the first call, were given out yesterday afternoon by Dr. S. S. Goldwater, chairman of the Mayor's Committee on Hospital and Medical Facilities:

University of Nebraska	34%
University of Cincinnati	32%
Western Reserve University	31%
Atlanta Medical College	17%
Hahnemann Medical College, Chicago	22%
University of Wisconsin	20%
Columbia University	30%
University and Bellevue Hospital Medical College	22%
Cornell University	21%
University of Virginia	9%
New York Homeopathic Medical College	33%
Syracuse University	29%
Medical College of South Carolina	18%
University of Michigan	23%
Jefferson Medical College	22%
Marquette University	20%

In some instances these figures refer to the graduating class only; in other instances they include the total student body. This information will be presented to Secretary Baker immediately, and may be used as the basis for immediate action. Mr. Frederick P. Keppel, Assistant to the Secretary of War, has telegraphed to Dr. Samuel W. Lambert, Dean of the College of Physicians and Surgeons, that "Secretary Baker is still awaiting definite figures as to amount actually drawn and accepted for service from medical schools. If you can expedite these figures it will be of great help. As soon as they are at hand Secretary Baker will take the question up with the President."

H. P. Davison, Chairman of the War Council of the American Red Cross, is interested in the maintenance of the hospital resources of the country, and has requested the Mayor's Committee on Hospital and Medical Facilities to furnish full information.

Dr. Walter B. James, President of the New York Academy of Medicine, in a letter to President Wilson, says, "I believe that in any case, and in spite of every precaution the army will suffer bitterly from the lack of adequately prepared medical men of the proper age, and that the civilian population will suffer, and indeed, is beginning to suffer already from the same cause. A number of agencies have already resulted in cutting down the number of students in the medical schools, and I believe that the present policy of drafting medical students into the army will inevitably result in disaster, both to the army itself and to the civilian population."

Mother M. Catherine Herbert, Superintendent of the Mary Immaculate Hospital, Jamaica, Long Island, writes, "I must state how we are situated in regard to internes. The doctors who had finished their term of interneship have applied to be taken on the service of the United States Government. We were fortunate enough to have three men who were ready to go on duty after graduation on June 1, 1917, but are sadly disappointed to learn that they were called to military duty. We have made every reasonable effort, but cannot get one graduate to take their places. If the importance of having service at the hospital crippled is considered, I am sure you will do everything in your power to avoid this."

Dr. Ralph B. Seem thus describes the crippling of the service of Johns Hopkins Hospital at Baltimore: "Last Spring we were requested by the Council of National Defense to furnish a list of the members of the medical staff, stating those who could be spared for military service and those who were needed in order to carry on the work of the hospital. Among those needed at home were included the names of the internes for the coming year. Some of these men have been drafted. When it was learned that they could not be exempted the matter was taken up with Major Noble, who advised the internes to join the Medical Corps immediately in order to prevent the men from being drafted as common soldiers. At the same time it was stated that it might be possible to make arrangements with the Surgeon-General to detail these men for duty in their own hospitals. We are now told that it is not possible to make any such arrangements. As a result we shall be greatly crippled in carrying on the work of the hospital in the coming year. There must be many hospitals throughout the country in the same predicament. This is particularly true in regard to the teaching institutions which have a double duty to perform."

The Philadelphia Hospital Association has organized for the protection of the interests of the hospitals of that city.

Dr. William B. Walsh, Secretary of the American Hospital Association, announces that the trustees of that Association have decided to send a delegation of its officers to Washington to make a personal appeal to the Secretary of War.

Dr. C. R. Bardeen, Dean of the Medical School of the University of Wisconsin, writes: "I am convinced that Congressional action is the only thing that will save the situation. I feel safe in assuring you that if such action is proposed it will receive strong support from all of the Wisconsin men in Congress."

Figures received from Chicago show that of 177 internes in the five leading hospitals in Chicago, forty-three have been called and accepted by the local draft boards; in addition twenty-eight have been drafted from eligible lists of sixty from which the Cook County Hospital was prepared to draw to fill its shortage. Thus of a total of one hundred and seventy-seven internes, seventy-one, or 41%, have been drafted.

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MANDATORY ESTABLISHMENT OF COUNTY HOSPITALS IN NEW YORK FOR TUBERCULOSIS.

Passed as a war measure, so that the state will be prepared to treat all cases of tuberculosis discovered in examining men drafted for the army or who are found in the army itself, an amendment to the County Tuberculosis Hospital Law was enacted at the recent session of the New York State Legislature providing as follows:

"Establishment of county hospital for tuberculosis. The Board of Supervisors of every county in the state containing a population of thirty-five thousand or more, as determined by the latest state census, shall establish, as hereinafter provided, a county hospital for the care and treatment of persons suffering from the disease known as tuberculosis, unless there already exists in such county a hospital or institution provided by the county or other authority and caring for persons suffering from tuberculosis, which is approved by the state commissioner of health. Such county hospital shall be available for patients on or before the first day of July, 1918. If the board of supervisors of any such county shall have failed to secure a site for a county tuberculosis hospital, and to have awarded contracts for the erection of suitable buildings thereon by the first day of January, 1918, it shall be the duty of the state commissioner of health forthwith to proceed to locate, construct, and place in operation a tuberculosis hospital in and for such county, the capacity of which shall not exceed the average number of deaths per annum from tuberculosis in such county during the past five years. For such purposes the state commissioner of health shall possess, and it shall be his duty to exercise all the powers which would have been possessed by the board of supervisors of such county, had such hospital been established and placed in operation by the board of supervisors thereof. All expenditures incurred by the state commissioner of health for and in connection with the location, construction and operation of such hospital shall be a charge upon the county, and provision shall be made for the payment therefor by the board of supervisors of such county in the same manner as in the case of other charges against the county. At any time after such hospital has been in operation, the board of supervisors in such county may appoint a board of managers for such hospital pursuant to the provisions of this act, and thirty days after the apointment of such board of managers by such board of supervisors, such hospital shall be transferred to such board of managers, and such board of managers shall thereafter possess and exercise all the powers of the board of managers of a county hospital for tuberculosis under this act, and the state commissioner of health shall be relieved from any responsibility therefor, except such responsibility as he exercises in regard to all county tuberculosis hospitals under the provisions of this act."

The new law affects twenty counties, eight of which have previously taken various steps leading to the erection of a hospital, but had not yet let contracts.

The State Charities Aid Association has issued a pamphlet entitled "A Compilation of the Laws of the State of New York Relative to County Tuberculosis Hospitals as of June 1, 1917." A copy may be secured from the Association upon request addressed to 105 East 22d Street, New York City.

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PERIODICAL EXAMINATION OF HEALTH DEPARTMENT EMPLOYEES.

There is no phase of public health work which transcends in value the periodical medical examination. With the great and rapidly growing interest in public health questions this medical attention and medical supervision of employees is becoming an accepted procedure —a matter of course. For the past two years every employee of the New York Department of Health has been obliged to meet this requirement of an annual medical examination, in addition to the one received on entrance to the Department service.

With the older employees, this periodical test is optional, but as the antagonism first manifested toward this innovation has largely disappeared, the majority of both sexes have been examined and some, more enlightened than the others, have requested an examination at short intervals, where the findings have disclosed conditions not entirely satisfactory to the individual.

Up to June 29, 1916, 2104 employees had been examined, but in order to retain a convenient starting-point for future investigations, only the first 2000 were included in the statistical records. Of the number mentioned, 1325 were women and 779 were men.

During the past year nearly 1000 re-examinations have been made, and of these 194 are men and 737 are women. Each case record receives a number, for no names are allowed to appear on the card, and the records, when completed at the end of the day's work, are placed in a special cabinet and kept under lock and key in the office of the Deputy Commissioner. Male employees are examined by a male physician, and female employees by a female physician. The physical record is not allowed to influence in any way the efficiency rating of the employee.

THE FINDINGS.

Of very great importance is the fact that 22.8 per cent. of those examined showed an albuminuria of greater or less degree. The tests applied were those in ordinary use for this purpose. The results therefore indicate an abnormality, a weakness or susceptibility which, if neglected, may be followed by chronic organic lesions and probably a shortening of life.

As many as 2.5 per cent. showed albuminuria combined with high blood pressure, and five cases of unexpected glycosuria were discovered.

Uncorrected defects of vision were found in 15.1 per cent. of cases and 17.71 per cent. showed abnormality in hearing.

Acute or chronic pharyngitis and hypertrophied tonsils were present in 29.3 per cent. and impairment of nasal breathing, due to some form of rhinitis or to deflected septum, existed in 17.2 per cent. of those examined.

Many of those suffering from such conditions were in urgent need of treatment, but had grown accustomed to their discomfort; they were, nevertheless, grateful for advice and willing to secure the necessary attention.

The number of organic heart lesions differed little between the sexes, though most medical examiners find the male sex suffering more frequently than the female from cardiac disease. Our figures were 8.8 per cent. for men and 6.7 per cent. for women. In the vast majority of instances the patients were not aware of any existing abnormality in the heart.

Pulmonary lesions existed in proportionately the same numbers, *i.e.*, about 8.7 per cent. and 5.5 per cent. for women. Some of these were very slight, others of more importance. Scarcely a dozen cases were serious enough to require prolonged absence from duty and medical care. When such cases were found, leave of absence was granted without question, but medical supervision during absence was insisted upon in order that the patient should receive the requisite care. Where the pulmonary abnormality is slight, the patient receives medical counsel and is advised to remain under the care of a physician until well.

It is interesting to notice that the number of men who had acquired an excessive avoirdupois is almost as great as the number of women similarly afflicted. In spite of the fact that women consume actually and relatively one-fifth less solid food than men, they attain adiposity much more readily, so that under ordinary conditions we expect a larger number of them to be overweight. The excessive weights were 18.9 per cent. of the men examined, and 21.2 per cent. of the women. As pronounced overweight has a marked effect in decreasing the length of life, those who show a tendency towards obesity receive careful warning and advice as to their habits and the regulation of their daily life. Re-examinations have shown an improvement in a number of such instances.

A relatively large number of women were much below the average weight, namely, 18.9 per cent. of those examined, but only 4.4 per cent. of the men were underweight.

The variations in blood pressure were considerable. As many as 11.4 per cent. of men exhibited high blood pressure (150 mm. Hg. or over), but several were far above this figure. Only 4 per cent. of the women showed pressure considerably above normal, but a large number of women—17.7 per cent. of women—manifested a very low pressure, that is, 108 mm. Hg. or below. Of these many were no higher than 100 mm. Hg. and several were even below this low figure.

Overweight and hypertension co-existed in 46 men and in 27 women; underweight and high blood pressure were found in five women and in one man; low weight and low blood pressure in one man and in thirty women.

In only a few cases could the high blood pressure be ascribed to aortic incompetence. It appeared to depend in most instances on other and widely varying causes. The large number of hypotension cases, especially among women, showed that many employees were suffering from a depressed vitality, and of these a considerable number presented a permanently low pressure. Forty-four women were markedly anaemic; only 19 men suffered in a similar way.

Nearly twice as many women as men complained of indigestion—7.5 per cent. women and 4.1 per cent. men—yet, strange to say, indigestion and constipation co-existed in a surprisingly small number,—only 6 per cent.,—and, though more women suffered from indigestion than men, their teeth were cleaner and otherwise in better condition. A certain number of both sexes were constipated—8.8 men and 17.5 women. Nearly 24 per cent. of those examined showed defective teeth, and 4.9 per cent. of this number were women. Notwithstanding, more women suffered from pyorrhoea alveolaris—about 1.2 per cent.—and scarcely half as many men.

The examinations disclosed more men than women suffering from hernia, from tenderness over the gall-bladder and spleen, and from enlarged liver. Sixteen cases of hernia were found among men; only five among women. Twenty-five men suffered from tender gall-bladder, and there were six cases of palpable spleen found and three of palpable liver. About one per cent. suffered from varicocele.

Women showed more nervous symptoms than men, suffered more from gastroptosis, gastric ulcer, hypertrophied thyroid, insomnia and from varicose veins and weak and flattened arches. Thirty-three women showed marked varicose veins, fifty had weak, painful or flattened arches. Two men had flat or painful arches and four showed varicose veins.

Exaggerated knee jerks were very common in women—as many as 137 showed this symptom—often combined with a fine tremor of the hands. About a half dozen men showed exaggerated reflexes, but in one the knee jerks were absent. Tremor was a symptom not often shown by the male employees, but two had coarse tremor of the hands.

Twice as many women as men complained of headache. Three men showed defects of speech and one woman.

Dr. Charles Dana says men suffer more from insomnia than women, yet 1.9 per cent. of men complained of sleeplessness in contrast to 2.7 per cent. of women who did so.

Abdominal tenderness, especially in the region of the appendix, was found on palpation in six men and in eight women. Movable kidney was found in two men and seven women. No man showed symptoms of gastric ulcer though four women did so. Twelve women presented symptoms of gastroptosis; no man was found suffering in this way.

Hypertrophied thyroid glands were found in 51 women and in two men. Women of European birth were more often affected with goitre than the native American women.

The unclassified impairments numbered 64 and included some skin lesions and other departures from the normal rather difficult to classify.

The menstrual history of women showed an extraordinary improvement over the conditions obtaining a few years ago, only 12 per cent. instead of the formerly recorded 50 per cent. and 75 per cent. giving a history of periodical disability. It is interesting to notice that slightly over three per cent. suffered only after unusual fatigue, overwork or on exposure to wet and cold.

Three women, two of them nurses, had never been vaccinated; one of these had had an attack of smallpox and supposed herself immune; all were, of course, vaccinated and successfully.

A comparatively small number of employees had been vaccinated against typhoid; of these 35 were nurses, 15 physicians, 15 laboratory workers and 16 others.

On re-examination about 10 per cent. of the persons examined showed very decided improvement over their former physical condition; some had gained in weight; some, after much effort, had lost weight; certain impairments had received treatment with resulting gain to the patient. Many, when originally examined, had shown no abnormality so that but little change was to be expected.

Every employee, when absent from duty on account of illness, should be re-examined on return to duty. If absences are frequent a re-examination should be made every three months, with a view to determining the cause of disability. Those who are below normal when first examined should be examined in six months' time.

Any employee desiring special medical advice should be made to feel that this is gladly given—that the object of the welfare division is to help keep the employees well and that these medical attentions are not in any sense a philanthropy but a very decided economy to the Health Department as well as to the taxpayer.

When any particular kind of work is found to have an injurious effect upon the health of the employee, a change to some other kind of employment should be made.

Periodical examinations can be made an important aid in correcting the alarming mortality of middle age in this country. If diseases are detected in their incipiency before impairment has become pronounced, and if the body is protected against possible injury by constant vigilance, a vast improvement would soon be effected.

The example of the New York Health Department should be followed by all the City Departments because of the economic value to the employer as well as to the employed.

RESIGNATIONS.

Dr. Edward G. Birge has resigned as director of the state bacteriological laboratory at Jacksonville, Fla., and has been succeeded by Dr. Burdett L. Arms, chief bacteriologist of the Alabama State Board of Health.

APPOINTMENTS.

Dr. Elliott Washburn has resigned as superintendent of the Rutland State Sanatorium to accept the position of superintendent of the municipal hospitals in Kansas City, Mo.

Professor E. V. McCollum of the University of Wisconsin has been appointed to take charge of the department of chemistry of the new school of hygiene and public health which the Rockefeller Foundation has established in connection with the medical school of the Johns Hopkins University.

Professor Frank C. Becht of the University of Chicago has been appointed professor of pharmacology in Northewestern University Medical School, succeeding Professor Hugh McGuigan, who has become professor of pharmacology in the University of Illinois.

Dr. A. E. Lambert has been appointed professor of histology and embryology in the college of medicine of the University of Vermont.

The Boston Medical and Surgical Journal

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MEETING OF THE SECTION OF SURGERY. JUNE 12, 1917.

THE MODERN TREATMENT OF BURNS, WITH ESPECIAL REFERENCE TO SEVERE BURNS AND TO THE USE OF AMBRINE AND ITS SUBSTITUTES.

BY EDWARD HAMMOND RISLEY, M.D., BOSTON.

PART I.

THIS paper and investigation were stimulated by the feeling that the present-day treatment of burns, both severe and trivial, leaves much to be desired, both in method of treatment and in end-results,—mortality and contractures. This is a class of cases of which every large hospital has at least from fifty to a hundred each year, in which results are obviously poor and in which very little detail interest is taken either by the surgeon or the house officer in charge.

Mortality is high, the period of disability is long and disabling, and deforming contractures are too common. From an economic point of view, to say nothing of suffering entailed, these cases should have better treatment.

Our investigation, founded on a detailed study of a series of cases under personal observation and treatment since May, 1914, a study and tabulation of all burned cases treated at the Massachusetts General Hospital for the past ten years, and a review of the literature, has aimed to settle the question of the best general plan of treatment, especially that of the kind of dressing, the prevention of sepsis and contractures, and shortening of the period of disability.

The author wishes to take this opportunity to thank the various members of the surgical staff of the Massachusetts General Hospital for courtesy extended to him in granting him the privilege of directing the care of the burned cases during this study, and also to the house officers on duty for very willing and ready coöperation.

The literature contains a few scattered observations on individual cases but only one treatise of value. This is a rather remarkable book by Dr. Herman Pfeiffer, in German, "Das Problem Des Verbrühunstodes," which takes up all phases of this question and is remarkable for the thoroughness with which it is presented and the detail into which it goes.

The clinical picture of the effects of severe thermal injury we have come to recognize as that of a profound toxemia, showing itself in the general toxic appearance of the patient, elevation of the temperature, etc., and by the effect of this toxic absorption on the kidneys, metabolism and gastrointestinal tract.

That the condition is actually one of a toxemia we also have convincing experimental proof, especially in Pfeiffer's exhaustive study. He looks upon the condition as one resulting from an auto-intoxication from the destruction of proteid bodies at the site of injury, or, in other words, a hyperproduction uremia or a toxicosis from pathologically increased proteid destruction and absorption.

In experimental work it is found that prompt removal of the burned area may be a life-saving measure in animals as well as in man. The transplantation of a burned area on to an uninjured animal may produce death with the same toxic and urinary symptoms as if the burn had been originally inflicted on the recipient of the transplant. In parabiotic animals the injured animal dies quickly, while the healthy mate dies later with the same symptoms, unless severed early. The blood of severely burned persons has been found toxic for guinea-pigs. The experiments on metabolism in Pfeiffer's work are highly technical but all go to establish more firmly the theory of toxic absorption. The picture, therefore, of the effects of severe burns develops in a clear manner to the well-recognized symptom-complex which in recent years we have learned to associate with peptone poisoning, with anaphylactic shock, hemolysin poisoning, uremia; in short, to the picture of a toxicosis from protein destruction.

The problem of the treatment of the burned patient is a broad and complicated one and divides itself, we believe, as follows:

1. The treatment of shock: when present.
2. The selection of the best form of treatment for the burned area, which subdivides itself into:
    (a) The kind of first dressing to use, and
    (b) The prevention of sepsis.
3. The problem of the prevention and treatment of contractures.
4. Prevention and treatment of complications, especially acute toxic nephritis and duodenal ulcer and the question of their relation to the toxemia, and the question of prognosis according to extent of surface burned and how to measure this.

1. TREATMENT OR PREVENTION OF SHOCK.

This is absolutely the first consideration and has been noticeably neglected in the past. Our first thought should not be to get the patient's clothes off and get a dressing on, but it should be "How much is this patient in shock and how can it best be combated?" No attempt should be made to move the patient until he has been relieved of his suffering by a good generous dose of morphia. If he is in marked shock he should be treated by methods best known to combat it, especially by the use of subpectoral salt infusion, and rectal shock enemata. Meanwhile, exposed areas should be lightly covered with a warm blanket to prevent chilling. If the patient receives benefit from this treatment within a half hour, one of three courses is open to us.

a. The clothing may be carefully cut away from the whole body and the patient placed exposed to the air, with the temperature of the room elevated to about 110° by open fire or other means; the open air treatment, or

b. He may be treated with some form of medicated dressing.

(1) He may be swathed with compress cloth saturated with a solution of from 1 to 5 per cent. picric acid. This dressing is best applied in sections and held lightly in place by roller bandage. If put on in sections it can be removed piecemeal and thus add less to the patient's later discomfort or shock. This first dressing may be left on for 48 hours before being disturbed at all.

(2) The burned area, if not extensive, may be painted with tincture of chlorid of iron and the patient left without dressing in a warm room. (The relative values and results of these forms of treatment will be discussed later.)

c. Should the patient not recover rapidly from his shock he should be immediately immersed in a continuous hot (90°-110°) saline or boric acid solution bath, the clothing to be cut away *after* the patient has been immersed and not previously. For in cases of severe burn the shock caused by the first dressing is always a serious consideration and may be fatal. This is substantiated by many case histories in the hospital records in which profound shock and death followed the first attempt at dressing. For instance, there have been many cases who were brought to the hospital in moderate shock who recovered somewhat while resting on the shock table but who, after the agony of removal of clothing, or the application of the first dressing, died an hour or so later with distinct signs of recurrent or delayed shock. We feel that this detail of treatment has often been overlooked and has been the actual cause of many possibly avoidable deaths. Therefore, the longer we can postpone the first dressing the better it will be for the patient, to whom every hour is of advantage in recovering from his primary shock.

Regardless of time, the patient should be kept in the hot bath until he has recovered from his shock and he should be reimmersed immediately should he, on removal, show signs of recurring shock.

This salt solution bath is of great benefit not only to the patient's general condition, but also furnishes nutrition to the devitalized cells that cannot be reached by the blood current now shut off by the thrombosis, which occludes much of the superficial capillary circulation. And it is essential to save the life of every cell, especially epithelial cells, which later are the regenerations of true skin. This bath has been found of great—even life-saving—value in the later or granulating stage of extensive burns when dressings could not be borne and the patient is in an exhausted condition—especially in children.

Our prime consideration, therefore, is the prevention and treatment of shock, by prolonging as long as possible and minimizing as much as possible the trauma of the first dressing, by warmth, by plenty of morphia, by flooding the system with fluids, and by the use of medicinal stimulation if necessary. This is our first duty and is a thing which the writer knows from personal experience has not secured the careful detailed attention in the past that it should receive. The burned case comes to us in shock which is both psychic and physical. If we hasten to get some sort of dressing on his local injury instead of first treating his psychic shock by the beneficent influence of morphia, and his physical shock by this and other well recognized means, we miss the whole point in the solution of this problem and add greatly to his already devitalized condition and increase his chances of death rather than of recovery. Too much stress cannot be laid on this very vital but often lightly considered part of the problem of the care of burned cases.

2. THE SELECTION OF THE BEST FORM OF DRESSING.

As shock and sepsis are for all practical considerations the only causes of death, let us turn to the second phase of our problem, the selection of the best form of local treatment, which is so closely related to the problem of the prevention of sepsis.

First Dressing.—We have adopted the rule never to use oily dressings; there is nothing in favor of an oily preparation except that it produces a fairly painless dressing. The objection is that it is not as a rule sterile, and favors the growth of bacteria; it does not absorb the discharges but keeps them in contact with the wound, causing maceration, and must be changed every 24 hours. As opposed to oily dressings, lotions are advocated, and the one most favored by a large number of men is picric acid in 1 to 5% solution. In favor of such a dressing are the following points: It can be sterilized. The discharges are absorbed by the dressing. The growth of bacteria is prevented and hence lessens the subsequent danger of constitutional symptoms. The first dressing can be left on at least 48 hours, thus giving the patient a chance to recover well from his shock. The dressing is clean, is healing *per se*, and above all, acts as an analgesic. Poisoning is *not* a common complication, when the weaker strengths are used. Most men consider this danger of poisoning a negligible one, and the advantages of this dressing to far outweigh any possible danger of absorption.

With a view to determining the value of these two well-recognized forms of treatment, and particularly to try out the picric acid method, all burned cases receiving House treatment at the Massachusetts General Hospital for a period of one year from May, 1914, were given one of the two forms, *i. e.*,

(a) All cases going to the West Surgical Service were dressed with picric acid at the first and subsequent dressings until the danger of immediate sepsis was over and other forms of medication seemed advisable.

(b) All cases going to the East Surgical Service were given open air treatment immediately.

The results in our series place us in a position to say that the open air treatment for extensive burns is vastly superior to any treatment in which any kind of dressing is used. Cases so treated recover more quickly from shock, suffer less pain, and get a better start than cases receiving *any* kind of dressing. The fact that all of our cases that died under this treatment did so from primary shock as a result of extensive burns, within 6 to 72 hours after entrance, makes it impossible exactly to compare statistics of those two forms of treatment, but we are convinced that the case that is not traumatized by any form of dressing is much more likely to recover than the one less carefully handled.

Picric acid is by all means a superior dressing to any of the oily substances. We have seen no symptoms of poisoning. In first degree burns it leaves a clean, dry and probably sterile surface and relieves pain very quickly. In second degree cases it has proven a splendid dressing, leaving in a few days a dry surface, all discharge being readily absorbed through the dressing, and an area which practically never becomes septic and heals quickly.

During the past six months we have been trying out a series of cases on the tincture of chlorid of iron, and as far as we have gone we have every reason to look upon this as a satisfactory method,—certainly in burns of the first and second degree of not too great extent. It has the advantage that no dressing is required, but a light bandage may be used, if desired, simply as a protection. The tincture is simply sopped on over the burned area. This, in most cases of more than first degree burns, is painful at the very onset, but a state of analgesia very quickly supervenes; and after its first application, patients never complain again, but speak enthusiastically of the comfort and freedom from pain. Repeated applications should be made once an hour or so until the affected area is well coated over and a dry protective layer is formed. After this only occasional applications need be made. The area is best left uncovered, as a thorough drying is what is desired. In our series so far only first and second degree burns of moderate extent have been treated in this manner and the results have been very satisfactory. The area dries up rapidly because of the astringent properties of the drug; there is no tendency to sepsis, and healing takes place apparently with considerable more rapidity than with other forms of treatment, because a dry, clean area has been obtained, instead of the usual moist, warm, foul one, produced especially when oily dressings are applied. We believe this treatment is of distinct value in superficial burns of limited extent.

The Prevention of Sepsis.—This depends fundamentally on the kind of first dressing used. Burned areas are presumably at first sterile, due to the action of the heat, but they are immediately contaminated by the first covering of dirty clothing or the first oily dressing. We have had no case of sepsis in either our open air or picric acid or tincture of chlorid of iron series. In all of our cases the skin surrounding the burned area is washed twice a day with alcohol, thus keeping the surrounding field as free from bacteria as possible. In the open air cases as soon as the area is crusted over, and sero-purulent material escapes, the crusts are incised or raised in order to allow free drainage, and the cleansing of the skin continued. Within about 6 to 10 days or less, warm salt solution compresses are applied to small portions of the crusted area and after 48 hours the crust is removed from this area, leaving a clean, raw surface, which soon begins to granulate.

We believe we can positively state, therefore, that sepsis can be prevented by the open air treatment, and the salt solution compress, cleansing of the surrounding skin, and avoidance of oily dressings at the onset.

We wish to lay particular stress on the early and painstaking and frequent pricking of the blebs, the incising of large crusted areas and the elevation of crusts to effect constant and proper drainage. To do this successfully a special nurse should be employed, and if done carefully and gently, very little discomfort is caused; toxic material is thus constantly drained off, the temperature is kept lowered and sepsis is much less likely to ensue. This must be done almost continuously to be successful and requires great patience and diligence, but the results obtained are worth all the extra labor expended.

3. THE PREVENTION OF CONTRACTURES.

From our observation of some 100 recent severely burned cases, we think we are in a position definitely to state that the percentage of contractures *can* be reduced at least 75 per cent. by three definite means. First, and most important, is the prevention of sepsis. Second, by the early immobilization of extremities affected by properly applied splints. This is most important and should be employed at the very onset of treatment, as soon as the case is over its shock and is running smoothly and *before* granulation begins. Third, by the early employment of passive motion and massage. In the hospital our cases are sent to the Zander department as soon as they can be moved, and treatment begins very gradually. Massage is applied to the skin immediately surrounding the burned area, and as much passive motion used as is consistent with comfort. This is done daily during granulation and afterwards till all signs of contracture have disappeared. After massage in the early stages, the limb is returned to its splint as long as that seems necessary, being taken out occasionally to rest the part. We believe that the above methods are of greatest value in effecting the early recovery to usefulness of these tedious cases.

To be successful, however in the use of splints they must be employed early and continuously and with great patience. Often, variously moulded plaster-of-Paris casts can be made to adjust to different parts of the body and to accommodate the dressed area, and are of the greatest service.

4. COMPLICATIONS.

Duodenal Ulcer.—The question of the incidence and etiology of duodenal ulcer in severe burns is yet an unsettled one. Just how many cases which have nausea and vomiting and epigastric pain within the first few days are developing duodenal ulcer is not possible to say. The fact that many of these are quickly relieved by dram doses of soda bicarbonate makes it seem unlikely that the symptoms are due to anything more then the toxemia produced by the burn. The percentage of autopsies on burned cases is so small that detailed statistics are not available. We have failed to find a single case of duodenal ulcer in any of the cases autopsied at the Massachusetts General Hospital since its foundation. Out of all cases of multiple burns coming to autopsy, 6 had either nausea, vomiting or pain in the epigastrium, but only three showed any pathology in the gastrointestinal tract. Most of these cases were in profound shock and lived but a few hours. One case in whom there were no symptoms (probably because of the degree of shock) showed two feet of upper ileum congested but no ulceration. One case with pain in the epigastrum showed at a point 125 c.m. above the ileocecal valve, intense redness of the mucous membrane with discrete and confluent irregular black-red areas but no ulceration. The cecum was even more affected but there was no sign of even minute ulceration. One case which vomited everything taken showed some reddening of the mucosa in the lower ileum but nothing in the region of the duodenum; and one case with slight nausea showed only the mucosa of the stomach mottled and the first portion of the duodenum red in color but no ulceration. We are therefore convinced, after a careful study and analysis of clinical and autopsy records,—taken in conjunction,—that actual duodenal ulcer following severe burns is so rare as to be practically negligible. We do, however, recognize a distinct train of symptoms strongly suggestive of this condition but which we believe are due to the toxemia as a general disturber of metabolism rather than as an exciter of distinct pathological changes in the duodenal mucous membrane.

The fact that these symptoms subside with proper treatment also suggests toxemia rather than actual lesion of the duodenum. It has been our experience that cases given dram doses of soda bicarbonate three or four times a day, together with a general forcing of fluids, recover quickly from the symptoms of toxemia. Certainly, physical examination of the cases shows none of the well-known signs of duodenal involvement.

5. PROGNOSIS, ACCORDING TO DEGREE AND EXTENT OF BURN.

A first degree burn of one-ninth of the body in a child is often fatal, while a first degree burn of two thirds of the body in adults generally results fatally. One third of the body area in second degree and much smaller areas in third degree are generally fatal.

Analysis of our series shows, however, that the prognosis is very variable and that young adults may survive even greater areas and recover rapidly, while young children and the old or feeble will often succumb to secondary shock with very slight and very small burns. The age and condition of the patient is of nearly as much prognostic value as the extent of burn, provided the burn is not of extreme extent or degree.

We have found that the more complicated methods of measuring the body surface, such as the use of Du Bois Height and Weight Formula Chart, are not practical, but that if one estimate the surface in the male as approximately 20 feet, and in the female as 16 feet, rough estimation of the extent burned can be made which is accurate enough for prognostic purposes. To know definitely whether one or two square meters more or less are involved is of little importance in comparison with a sound appreciation of the patient's general condition.

The mortality in this series was 23.4 per cent., which is about the usual mortality in this type of case. The mortality is higher when the chest, back, or abdomen is involved than when equal or even greater areas of skin are burned on the extremities.

The presence of shock is the most important factor in making the prognosis at the onset. Practically all badly shocked cases die, irrespective of previous condition or subsequent treatment.

A careful review and consideration of the evidence at hand in the study of cases of severe burns would lead us to the following general conclusions:

1. The three most important factors in the treatment of burned cases are:

(*a*) Prevention and treatment of shock.

(*b*) Prevention of sepsis.

(*c*) Prevention and treatment of contractures.

2. Many deaths have been caused by ill-advised attempts at a first dressing.

3. The form of first dressing is largely responsible for subsequent sepsis. Oily dressings should be avoided. Cleansing of the skin surrounding the burned area with alcohol aids in preventing sepsis. Constant drainage of discharges is essential.

4. The open air treatment is far superior to that in which any form of dressing is used.

5. Either picric acid or Tr. chlorid of iron are by far the best forms of medicated dressing.

6. Contractures can be prevented in 75 per cent. of cases formerly contracting, by the early use of properly adjusted splints and by early passive motion and massage.

7. Duodenal ulcer is a rare complication and can be almost discounted.

We would formulate the following general rules for treating burned cases:

1. Combat shock first.
2. Treat all shocked cases or those with extensive burns by the open air method or the temporary use of the hot bath.
3. Avoid oily dressings.
4. In burns of the extremities—if fairly extensive, but not requiring open air—use picric acid.
5. In all other burns use picric acid, Tr. chlorid of iron, or the more modern paraffin film treatment according to preference or experience.

Part II.

THE AMBRINE TREATMENT OF BURNS.

It is probable that most of us who have not been abroad since the war began, first heard of the ambrine treatment of burns through the lay press, especially in articles that appeared in the *Outlook*, describing the wonderful and surprising rapid regeneration of tissue—even of muscle and bone—after its use. Comparatively few of the men who have been abroad to do war surgery have actually seen it in use, and our knowledge of it today has been largely a matter of hearsay and conversational reports of a few men who have seen it used.

This preparation is a recent one invented by Le Docteur Bart de Sanfort, the news of whose work comes from St. Nicholas hospital, near Paris. Dr. Sanfort made a report of its use at the French Academy of Medicine a little over two years ago, but no detailed accounts of its composition, method of application, or reasons for its superiority have yet appeared in the foreign medical journals. A few scattered abstracts appeared from time to time in the *British Medical Journal* in 1916, but these added nothing to the lay reports. Efforts by several men to obtain the formula for its preparation have been evasively answered by the statement that the excellent product could now be obtained from the French representatives in New York for $6.00 the pound.

These facts do not, of course, put this preparation on a strictly ethical basis, and a certain amount of skepticism has naturally resulted.

With the object of getting some knowledge of the composition of this product before its general use was instituted, the Hospital obtained a pound of ambrine, which was given to Dr. Denis, our chemist, for analysis. It was found to contain, roughly, 90 to 95 per cent. of paraffin of a good grade, 5 per cent., more or less, of beeswax, a small amount of resin, probably some such product as eucalyptol, and an aniline coloring matter, enough to give it its peculiar gray-brown hue. The melting-point was about 140° F. With this approximate analysis at hand, a substitute was then made up with the following composition:

Paraffin of melting point 52° C.	90%
Japan beeswax	5%
Spermaceti	5%

These were heated together at 150° for 30 minutes. No coloring matter or deodorant or disinfectant was added. This preparation has been used independently and alongside of ambrine in order to check up the results on both, and it shall be my aim to give you as fair and unbiased a report on these paraffin preparations as possible, based on a rather limited number of cases.

The method of application of either is as follows: The burned area is cleaned up very gently as far as possible, removing dead skin and traces of previous medication, and all blebs pricked near their bases but the cover not removed. The surrounding skin is cleaned thoroughly with alcohol and the part allowed to dry as much as possible, or drying is hastened by the use of a warm air blower. Meanwhile, the ambrine or its substitute has been heated on a water bath—the ambrine to about 140° F. and the substitute to about 130° F. This is then painted or sprayed quickly over the burned area and for about two inches over the surrounding healthy skin. Theoretically, the spray is the best, because it does not injure the delicate granulations present and can be blown into and fills up every minute depression of the injured surface; but practically, the gentle application with a flat camel's-hair brush about 1½ inches wide does not harm the injured tissues. If applied gently and quickly at this heat a thin, smooth film is formed over the burned area, which makes a firm air-tight dressing. A piece of sheet wadding a little larger than the burned area is then peeled apart so that a very thin layer only is left and this is laid over the area and a second coat of ambrine painted quickly over this. The part is placed on a splint to immobilize and prevent cracking of the ambrine film. It may be further covered with a bandage. This dressing must be changed at the end of 24 hours. Generally, enough serum or discharge collects to "float" the ambrine coating to some extent. It lifts off easily, and generally intact, as it practically never sticks to the burned part. The area is now washed gently with warm boric solution, dried with a blower and the preparation reapplied as before, repeating each 24 hours until the area is healed.

The first question that naturally arises is, "Isn't this substance, put on at 140°, painful?" The author can testify, from some limited burns made on his own person to test this point, that the application can be said to be but momentarily painful. A rather uncomfortable sense of extreme heat is produced at the very first moment of application, but the very minute the first coating is on this sensation quickly subsides and gives place to one of rather soothing comfort. There is a slight feeling of constriction or adhesiveness for the first few hours after the dressing is first applied, but after that no particular sensation is noticed. Patients who have had more extensive burns treated give evidence of the comfort of the dressing but do not allow that the first application of the hot wax is absolutely without temporary discomfort. It is not a painful dressing, and its removal is *absolutely* without discomfort of any kind. It certainly is remarkably painless in comparison with any of our older forms of dressing.

The second question which I think would naturally arise is, "Why does not such a dressing give a favorable chance for bacterial growth?" The answer is simply that it does not. A distinct odor is generally given off at the time of removal of the coating but this has a stale, musty sort of odor more than a putrefactive odor. None of the cases of burns of limited extent, *i. e.*, hands, feet, arms, etc., in our series has showed the slightest signs of sepsis.

The lack of sepsis has been one of the rather striking things about this treatment. Case 5 of our series is a very good illustration:

Case 5. Miss M. received second and third degree burns of the backs and fronts of both lower legs between the knees and ankles. She treated the burns with strong sulpho-naphthol for two weeks before coming to the hospital and produced, in addition, a generous sulpho-naphthol burn of the skin for about two inches on all sides of the original burned area, which latter was covered over with a dirty, thick, leathery slough. The area on admission was cleaned up as much as possible with a chlorinated soak, ambrine was applied to the right leg and the substitute to the left. In 48 hours the slough had entirely separated from both legs, leaving a perfectly clean granulating area, except where the Achilles tendon was exposed on the left leg. This case, while not a favorable one for ambrine, proves its worth as a dressing which certainly does not favor infection.

The length of time necessary for complete healing is another important point.

Our first four ambrine or ambrine substitute cases were first and second degree cases and healed up in 9, 12, 8 and 14 days, respectively. Case 1 had enormous blebs and did not look as if it would be healed for weeks and yet at the end of 9 days presented a smooth, soft, red scar and no scabs.

The resulting scar in the very small number of cases we have had has been noticeable for its softness, smoothness and pliability. It never has scabs and does not seem to crack and bleed as readily as burned areas under other forms of treatment.

It may now be asked, "What is the reason for the apparently favorable results obtainable by this preparation? Is it chemical or mechanical?"

It certainly is not chemical in any sense that original ambrine has some secret constituent which renders it superior to any paraffin substitute. For, so far as we could determine, the substitute cases did exactly as well as the ambrine cases, healed as quickly, were as comfortable, did not become septic, and left just as smooth a scar.

The effect of this preparation, therefore, must be purely mechanical in its action. It seems probable that this mechanical action is favorable, first, because it immobilizes the affected area; second, it is a sterile dressing; third, it makes an air-tight sealed dressing—which may possibly be the reason why it does not favor bacterial growth; and fourth, by its close adhesion to the part favors ingrowth of granulations while it discourages up-growth or heaping up of granulation tissue, to some extent like adhesive plaster on the sluggish granulations of a varicose ulcer; or it may act as a supporting framework for new granulations. I have a feeling that the very soft, smooth scar may be due in a large measure to the contact with the paraffin and, of course, to the absence of sepsis.

There is a considerable amount of experimental work being done with various paraffin preparations or films. The first article of value to appear was that of Sollmann, of Cleveland, who also objects to the secrecy in regard to ambrine and the American preparations which have recently appeared on the market, because of the difficulty of comparing results in known and unknown preparations. Sollmann has made simple preparations which could be imitated by any pharmacist and has avoided the use of any coloring matter, deodorant or antiseptic in order that they might be tested purely from a mechanical point of view.

Preparations were made up to test several factors: 1, melting-point; 2, fragility; 3, stretching quality; 4, pliability; 5 hardness.

After testing the above, the author states that the preparation and mechanical properties of a series of paraffin film mixtures suggests that the most important mechanical property of such films, from the therapeutic point of view, is their hardness. It is suggested that several degrees of hardness might possess advantages under different conditions. Surgeons using these paraffin preparations are urged to use simple combinations of known composition so that their results can be compared and improvements intelligently made.

This author found that ordinary paraffin, melting at about 53° C. (or 122° F.), appears to possess practically the same mechanical properties as the French preparation, and urged it as the standard of comparison.

The article is of clinical as well as pharmacological interest.

In a recent visit to the Angell Memorial Hospital for Animals on Longwood Avenue, I found the American proprietary preparation called Parrasine, made by the Abbott Laboratories of Chicago, and extensively advertised in the *Journal of the A. M. A.*, and elsewhere, was being used on burned animals with satisfactory results. The veterinarian there was convinced that cases healed more quickly under this form of treatment than with previous methods.

From my rather limited experience with paraffin preparations I can say that I have been converted from skepticism to a rather firm belief that this method of treating burns (certainly those of limited area) is a decided advance over other methods formerly employed.

Points in its favor are: It is not a painful dressing; it is easy of application and removal; it does not favor infection; it produces more rapid healing; it leaves a smooth, soft, pliable scar.

From the point of view of comfort of the patient alone it is a decided advance over any other form of dressing.

DISCUSSION.

Dr. J. B. Blake, Boston: I should like to compliment the reader on his paper, especially in what he said and the way in which he said it. The subject of burns is an extremely important one, and it is altogether too often overlooked as an excellent subject for discussion at medical societies.

There was one single aspect which the reader did not consider, and that was the first dressing of burns at home, which comes before us now in the many lectures in first aid, and which it is worth while speaking of for a moment before discussing the paper as a whole. The old dressings which have been recommended have largely been oil of some sort, or flour or molasses. It seems to me it is time now to drop all these recommendations, even though we may be talking to the mothers who live in the poorer parts of the city. It is always possible now to get hot water, and salt, and usually bicarbonate of soda. I think we ought to recommend warm water (on a clean cloth) into which salt is put, or saleratus, in the proportion, roughly speaking, of a teaspoonful to the pint. This would be an infinitely better first dressing than either carron oil or olive oil or flour or molasses. I would recommend that in the first-aid instructions which are now being given all over the country.

In my experience with burns, so far as it has coincided in method of treatment, I agree entirely with Dr. Risley, particularly in the matter of not removing the first dressing when shock exists, which he has emphasized even more than I have in the past. Cases of extensive burns, especially in children, are probably doomed to death by unnecessary and interfering first dressings. If a carron oil or even a molasses dressing has been put on it is better to stay on 24 hours and take the chance of additional sepsis, rather than take the chance of increasing the shock, by removing it. I should go even so far as to question whether it might not be permissible to give paregoric to the child together with the first dressing. That is open to question, but if there is ever a time when paregoric may be used by the laity it is to combat the early shock in a child.

The second point I wish to mention is the fact that Dr. Risley reports burns, all of which, in a big hospital, have been assigned to a single service. The instant you make burns a subject of intensive study by a single trained expert or a group of experts, your results will necessarily begin to improve.

My first knowledge of ambrine, beyond reference in the daily press, I got with Dr. Faulkner at an illustrated lecture given in Boston some months ago.

The pictures were misleading. They were supposed to prove that, under the influence of this mysterious drug burns healed more quickly than ever before. The burns had been subjected to routine treatment by a certain number of observers and had not been distributed widely through the various wards. As regards the pictures themselves, it seemed to me they were very highly colored—to put it mildly. The first pictures were taken before the burns had healed at all, and greatly emphasized and exaggerated the size and depth of burn. The subsequent pictures were subjected to every possible method of making them seem better than they were. Then there were a few pictures which represented absolutely denuded areas which were supposed to get better in a time which was absolutely impossible. We divided them into two groups, one group which exaggerated the burns and suggested results which were only approximately obtained; and the other which apparently gave pictures that could not possibly occur. It is not possible for cicatrization to occur over an area of 50 or 60 square inches in three or four days.

We have tried at the City Hospital the ambrine subsitute which Dr. Risley described. In some nervous children we had difficulty in applying it. In adults I believe it to be, on the whole, the best dressing I know, with the possible exception of one per cent. picric acid.

In regard to ambrine, another reason why the scars are soft is perhaps in the fact that there is so little trauma in removing the dressing. Taking a dressing soaked with secretion from the burns of the average child, is an extremely traumatizing thing, and it produces shock. Nurses believe they cannot do it without hurting the child. The resulting hemorrhage tends toward the organization of a scar which is thicker than it otherwise would be. The picric acid, so far as my experience goes, is the best routine dressing for burns. We tried it at the City Hospital some years ago at the instigation of Dr. Jonas, beginning with a saturated solution, which was altogether too powerful; the statistics of picric acid poisoning presumably refer to the use of a saturated solution. We diluted until we got to a one per cent. for the average adult and even one-half per cent. for children. Dr. Jonas tells me that after ten years of experience he has no reason to modify his judgment of picric acid, and he still believes it by far the best routine treatment of burns. He has his gauze made up in small packages not more than four inches square, folded and covered with paper; and the firemen and engineers are taught how to undo the paper packages and to place the contents of the package on the burn, allowing the paper to stay over it as a temporary first dressing, attaching it with adhesive straps. This can stay on 24 hours, and in some cases 48 hours. If possible, he leaves the different pieces of gauze in position for three to four and even five to six days, moistening them once in 24 hours. He seldom has to resort to skin grafting.

In civil hospitals, we are often compelled to resort to skin grafting and in so doing we use the Revidan grafts. We make the graft thicker than the original Revidan, placing it at intervals of perhaps one-fourth inch, and covering one square inch of a burn which may be twelve inches square. We can begin grafting earlier and shorten the course of the cicatrization a good deal, because it is not necessary in this method to wait until the entire surface of the burn is ready for grafting at once.

Dr. Jonas also suggested the outdoor treatment, and in cold weather the exposure to the electric light. He has found the use of electric light up to 60 and 80 and 100 candle-power, the bulbs being at a distance of 12 to 20 inches from the burned surface, to be extremely beneficial, drying up the burns if discharging freely and hurrying along the cicartrization, and unquestionably aiming toward a smooth and pliable scar.

The important points which I would emphasize are,—the substitution of alkaline first dressings for oil or oily substances; the special effort to reduce shock probably without removing the first dressing for 24 hours, the use of ambrine or 1% picric acid as a routine for a large majority of burns, and exposure to sunlight or electric light after 48 to 60 hours.

Dr. J. M. Birnie, Springfield: I cannot add very much to this very excellent paper of Dr. Risley's, but I do want to emphasize one point which he has made, and that is the fixation of burns to prevent contracture, even going to the extent of putting on plaster casts, which we do. And also I can add a little testimony in the use of paraffin dressings. We have used them in several cases and I must say that I am very enthusiastic over them, both as to results and comfort to patients. We have not used ambrine. We have used a substitute which we have obtained at various drug stores. We have written for the following prescription put up at the ordinary druggists, and apparently it is the same preparation from each one:—

1 part oil of eucalyptus,
5 parts olive oil,
20 to 30 parts hard paraffin,
Balance to 100, soft paraffin.

I do not think the oil of eucalyptus is at all necessary but we put it in because it was in the original analysis. We have tried putting it on with a camel's-hair brush, and also with a sprayer. In the first few cases we used a Wondermist sprayer and afterwards we decided to use a little bit of an atomizer, heating up the solution, pouring it into a bottle, keeping the bottle in a pan of hot water. We spray it and then do not put the sheet wadding in the second application. We put on just one film of the paraffin substitute and put loose gauze outside. We do not find that we have sepsis nor do we find it always necessary to change the dressing every 24 hours. In some cases you can leave it on 48 hours, and along towards the end, even longer. We had one case where a man with oily overalls on backed into a flaring torch. He was burned from the waist to the ankles. The deepest burns were in the flexor surface and they were only more or less superficial on the extensor surfaces. That man had boric solution until he could get to the hospital, and then he was immediately treated with this paraffin substitute put on with a Wondermist sprayer. His burns have healed now and he made a wonderful recovery.

If you write for a simple prescription of that kind and an ordinary atomizer, any one can use the treatment.

TREATMENT OF OLD UNUNITED FRACTURE OF THE NECK OF THE FEMUR BY TRANSPLANTATION OF THE HEAD OF THE FEMUR TO THE TROCHANTER.

By E. G. Brackett, M.D., Boston,
and
May Sung New, M.D., Boston.

[From the Orthopedic Department, Massachusetts General Hospital.]

No attempt is made in this communication to review the literature on this subject, or to discuss the various methods of treating this condition, for it has been thoroughly done many times. It will deal only with the old fractures of the neck of the femur, at a period from some months to several years after the injury, when there has already been absorption of practically the entire neck, and when the partly atrophied head consists only of the articular portion, not projecting beyond the acetabulum, and must be regarded somewhat in the light of a sequestrum. It can derive a certain amount of nourishment from the joint fluids in which it is bathed, and also some from the non-vascular fibrous attachment, when such exists, but this union to the head fragment is often found, on operation, to be slight, and hardly enough to be the channel of much nourishment, and the actual bleeding of the bone when it is cut seems to be always questionable. It surely is very different from the dead sequestrum, but it is also very different from the bleeding cut surface of normal bone. This nutritive defect of the head is one of the most important factors to be reckoned with in the attempts to procure firm union between two fragments so long separated, for we must bring about conditions sufficiently favorable for the fragment to become thoroughly living again. The principle in the treatment of this condition in the fresh cases, when nutrition is good, and in the long-standing, when nutrition is necessarily poor, must be radically different. The retention by nail has practically been discarded, as well as the use of graft for retention, as the atrophied head is too soft to withstand any force put upon it, for the purpose of retention or fixation. The use of the graft as a carrier or trellis for osteoblastic stimulus, unless a firm apposition is obtained, is nearly as futile, for the graft, once detached from its bed, becomes dead bone, one end of which is fastened into live bone and the other into a fragment of questionable viability. It is reasonable to expect that the first end should live, but it is expecting a good deal that this insert, which itself must be renourished from its attachment into the femoral shaft, can carry its regenerative power across the bridge between the two and into the old head, at least partly dead, and restore it to normal activity. On attempting to freshen the surfaces of the two fragments, it is necessary to hollow the femoral surface of the head, for there is usually not enough of the head to make a flat fresh surface without encroaching on the cartilage edge of the articular surface; nor is there enough left of the neck to fashion a convex surface which will protrude into the newly made concavity of the head; therefore, any attempt to appose these two freshened surfaces results in approximately placing a cupped or mushroom-shaped head on a flat surface of the shaft, with only the edges of the head, at the best, in contact. If the leg is abducted, the upward riding trochanter pulls the neck surface away from the head, and prevents the firm contact which is necessary for a strong bony union. If, on the other hand, the leg is placed in the position of extension, then the small graft or peg, driven into the head, too soft to be relied upon to withstand any degree of force, must be relied upon to withstand the strong upward thrust of the thigh muscles. The fact is, by these usual methods, a firm bony union in these old cases of fracture of the neck of the femur, ununited after a long time, is not at all common. It has been found difficult to look up the results of operation on the old fracture cases. The pretty constant failure to obtain a firm bony union has not been an encouragement to go through the experience of the long convalescence added to the operation. Twenty-four cases have been studied, among which are some for which I have to thank the general surgical services of the Massachusetts General Hospital for the privilege of using. Of these (24), one has a useful leg. This report is by letter; it is (4?) years since the operation. It has not been possible to get an x-ray, but the patient writes that his leg is strong and useful, and that he has no pain. The operation was freshening the surfaces, no peg or graft was used. The man was younger than the average in these cases, being in the thirties, therefore at a time when the bone repair is more active. This is the only case of this series in which a satisfactory result was obtained. Results such as these, combined with the fact that these patients are permanently out of commission for any activity, is sufficient reason for advocating active surgical measures, even if they are radical.

The method here considered treats the femoral head as if it were a real sequestrum. We know that an entirely dead bone becomes vitalized if grafted on to living cancellar bone, and this seemed to be a solution to the problem here. The details were as to where to place the old head, and how. The thrust of weight-bearing from the shaft to the head should be as direct as possible, and yet have enough obliquity to adapt itself to the weight-bearing plane of the acetabulum. To accomplish this, the head is placed on the inner side of the top of the sawed-off trochanter, and in this way the thrust is passed directly from the shaft to the head, so that there is little or no distraction strain in weight-bearing, and the head has its most favorable position for a restored function, to gain which some compromise must be made.

Independent of the ordinary surgical conditions which must always be considered in any major operation, there is one contraindication. Sometimes, after joint injury, particularly in the older people, there is found a distinct osteoarthritic change, with thinning of cartilage, as well as the tendency to overgrowths. Under these conditions, a favorable functional result could not be expected, and this operation must not be advised.

Technic. The joint is best exposed by the inter-muscular route, between the tensor fasciae femoris and gluteus medius, by an incision from the anterior superior spine to the middle of the trochanter, turning downward, parallel to the line of the femur for a few inches—then starting again at the angle of the oblique and vertical positions of the first, a curved incision is carried backwards and upwards three or four inches. The tensor fasciae femoris and gluteus medius are separated, the muscle attachments on the outside of the trochanter are removed subperiosteally, or with a thin bone attachment, and the top of the trochanter removed so as to save the attachment of the gluteus minimus and pyriformis. These muscles are then all turned backwards and upwards, and the upper and anterior portion of the capsule exposed, to the edge of the acetabulum. The capsule is opened longitudinally to its fibers, on the upper portion of its anterior surface, saving the attachment of the Y ligament, if possible, but which, however, cannot always be done.

The capsule above the opening is then detached from the femur and retracted outward and backward; the trochanter cut off just below the level of the upper edge of the head, the inner portion rounded to correspond to the curve of a 1½ inches to 2 inches radius, saving the anterior and inner cortex. The outer portion is either cut off obliquely, or a wedge taken out, near the outer surface, allowing the outer cortex to be pushed inward. The free surface of the head is thoroughly freshened, covering this area, so as to make a corresponding curve, to the rounded top of the trochanter. In abduction of the leg, the convex surface which has been fashioned on the trochanter, is brought directly into the concaved head, and in this position is firmly held against it. In this way the femoral head with its freshened surface is placed directly on the freshened cancellar surface of the trochanter,—an ideal condition for the vitalizing union of the poorly nourished fragment. The head is not placed directly on the top of the trochanter, for this would not allow the best position in the acetabulum, but on the inner and upper sides, which gives to it a somewhat oblique angle, partly resembling its normal direction, but without the normal neck. The stitches are placed in the capsule, but not tied until the leg is put into position of abduction, and the head seen to be in the relation to the end of the trochanter which is desired, in order that this contact can be assured, and the position of the leg is then maintained until the plaster is applied. The stitches are then tied, the outer attachment of the capsule which has been freed is secured with the muscle attachment. The attachments of the gluteus medius and minimus, and pyriformis, are either secured to the outer side of the trochanter, or are inserted into the wedge-shaped depression, which has been made, in order to round off its upper and outer end. The wound should be tightly closed in layers, a plaster spica applied, including the foot of the affected, and the other leg, to the knee, and extending well up to the lower thorax on the opposite side from the operated leg. As a rule, the extreme degree of abduction is not required, and less inversion than in the Whitman method with the fresh fractures. This fixation is maintained for eight to ten weeks, fixation with an ambulatory plaster, but without weight-bearing for about two months more, and beginning weight-bearing with active motion at the end of this period. The ideal treatment would seem to be fixation by removable plaster at the end of the first eight or ten weeks, with beginning massage and gentle passive motion; but unless this can be carried out with very intelligent precision, the complete fixation is the safer plan. The bone contact between the two fragments cannot be made over the entire surface of the head, so that considerable bridging in of new bone is necessary, for which sufficient time must be allowed, and a change in the angle of union between the trochanter and head has been observed, after too early motion or strain. The motion must be brought back slowly, for the capsule must be partly newly formed and newly attached, and a considerable amount of flexibility must be developed before all of the potential motion can be expected. There is no diminution in the shortening, or at least not a practical amount, for there is too much adaptive contraction of all structures to allow any decided change in the relative position of the leg to the pelvis. A greater range of motion, however, is possible than might be expected, an entirely practical amount of flexion abduction and rotation results. The amount of this depends somewhat on the oblique position of the head on the trochanter, and on the rounding off of its overlapping portions.

The first case operated on in this series and by this method was in 1911. A man of thirty-five had sustained a fracture of the neck of the femur in a severe railway accident, one and one half years previously. There was no union, and the man was out of commission. The attempt was made to freshen the surfaces and to bring the surface together in the usual method. The position of the trochanter, with the shape of the surface of the remains of the neck, combined with the irregular shape of the surface of the head fragment, which had a large spur projecting downwards and backwards, made this impossible, and suggested this transplantation of the head as a compromise. The recovery was uneventful, and the man finally returned to work, and has been working steadily as a railway conductor for several years. Nine cases have been done, but seven only can be used as indicative of results, for two are too recent to be counted. One is just out of first plaster, at the end of ten weeks, and the leg is firm to any up-and-down motion, and the upward thrust has the solid feel, and the x-ray shows the head at an angle on the trochanter. The indications are of a good union, but the case should not be used for definite statistics. The others all have had firm union with strong weight-bearing, limited, but a practical amount of motion, with the same amount of shortening which existed before the operation.

The proceeding is a radical one, but the operation is one that is easily borne by anyone in reasonably good condition, provided there is no organic disease, and the recumbency in plaster is made more safe by the double spica, as it allows a considerable change in position. The very great deal of disability in those who still have a long working period ahead, and the prominence of the pain element, is indication for a reasonable although radical attempt to obtain a useful leg.

DISCUSSION.

Dr. C. L. Scudder, Boston: There is only one pleasure that is greater than hearing Dr. Brackett present this subject, and that is to see him operate, which I have had the opportunity of doing several times on cases of this sort. I think his paper is a distinct contribution to the procedures which the surgeon may have in this group of cases, because, as has already been intimated, and as we know from practical experience, these patients are practically helpless, chronic invalids, unable to get about.

Now, fractures of the neck of the femur, in my mind, should be regarded something after this fashion, and they really group themselves into two groups,—without any reference to the old classification which has to do with the capsule and which is of very little importance practically: into the impacted cases and the unimpacted cases. If the impaction is a good impaction, if there is a good position, we are all agreed, I think, that we should let that impaction alone, and that probably union will take place in a large proportion of cases. If the impaction is a poor impaction, that is, the kind of impaction in which there is great eversion or inversion, the question will arise, is the individual old or young? If it is an old person, with poor impaction, it is better to do as we would with a good impaction,—let it alone and treat the case by immobilization. If it is a young, active adult, I believe we are justified in gently breaking up that impaction and either reimpacting it by a blow over the trochanter, or replacing it in position with abduction according to the Whitman method.

With the unimpacted cases I think the situation is quite different. We have here the recent cases in which I believe we should use the Whitman method or the Cotton method. These are the unimpacted cases which you see soon after the injury, and we know that if the leg is put in the abducted position and extended, union will take place.

Then there are the old cases of unimpacted fractures which Dr. Brackett has spoken of,—and I believe that Dr. Brackett's operation which he has described, and the results of which we have seen, is a distinct contribution to this group of old unimpacted necks of the femur. We may use, if we please, the method of refracturing the neck, and we may simply lay open the joint, curette the surface and put the parts as nearly in apposition as possible; and hope that union will take place. Then we may do what has been suggested,—refracture these edges and put a graft of bone from the tibia through, and place the parts in as near apposition before putting the graft through as possible; and in a good proportion of these cases union takes place, but I am inclined to think it does not as often as supposed.

In the reported cases of Dr. Albee in New York, we should scan very carefully the kind of cases in which he has performed this operation, because, as I understand it, Dr. Albee is doing this operation in certain recent cases with obviously good results; but in the old ununited cases it is a question whether this grafting operation is one which will meet the conditions satisfactorily in the largest percentage of cases.

I believe that one great merit of Dr. Brackett's operation is that it is comparatively simple to do. It makes the weight-bearing come on the normal places. I think this is a distinct advance in the treatment of this particular group of cases.

Dr. Frederic J. Cotton, Boston: I agree perfectly with what Dr. Scudder has just said, and I think this operation helps us around a corner which we have not known the way about before.

I have done a good many of these operations which were extremely unsatisfactory, but I am not quite as pessimistic as Dr. Brackett is about the results. The fact is, however, we get bony union in only a small proportion of cases, and in the majority of cases we do not even get functional result. Dr. Brackett has shown us the way out of this.

The reason some of these operations have been so unsatisfactory is that we tried to restore the bone to normal length; whereas Dr. Brackett reconstructs a new bone without attempting to restore the length.

Dr. John D. Adams, Boston: I have one word of commendation I want to add. I surely commend the operation most highly as being a comparatively simple operation, as hip operations go; all of which are difficult.

My experience is based on one case which Dr. Brackett saw in consultation. She has been out of plaster now only about three weeks, and is about on crutches, of course bearing no weight; but apparently the union is firm, and the patient has a little less than one-half inch shortening where there was over an inch. This I considered a rather good result.

Spina Bifida and Allied Malformations. Based on an Operative Experience of 34 Cases.

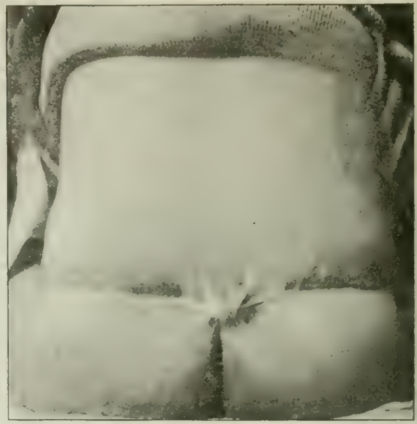
By Torr Wagner Harmer, M.D., Boston.

I do not come here with indiscriminating enthusiasm and optimism, but rather with the hope of casting a tiny ray of sunshine on a gloomy field of endeavor. There are certain conditions which we all generally regard as hopeless. It is true that not infrequently the condition is one which is inconsistent with life. It must be true, however, that there are other conditions which cause death because our methods are inadequate. It is needless to say that constant efforts to combat such conditions should be made. No matter how discouraging the work is, it should be done. In this way new methods have been discovered, which have greatly reduced the mortality of certain diseases so that these diseases today, although dreaded, are not regarded as hopeless, and some not even greatly dreaded.

In short, we should hold before us the words of Cicero, "*Dum anima est, spes est.*"

One condition in which the prognosis is very bad is spina bifida. Fortunately, it is a comparatively rare condition, and therefore any systematic study and efforts to remedy can best be carried out at a hospital, and best by permitting one member of the staff to do all cases of this nature. I appreciate the courtesy shown me by the other members of the Surgical Staff at the Children's Hospital in permitting me to see and operate all the cases of spina bifida and allied malformations during the past twenty months. This constitutes a series of thirty cases. To these I add a case operated at the Boston Lying-in Hospital, and three others done in private practice.* This is a total of thirty-four cases, which I believe is an unusual experience; too small to deduce statistics of any nature, but ample enough to furnish a few points in operative technic. In fact, the earlier hard cases took me three-quarters of an hour to one hour, whereas now similar cases take but twenty to twenty-five minutes, and simpler cases I have done in ten or twelve.

As you know, spina bifida is a defect in closure of the neural canal of one or more vertebrae. This defect may be anterior or posterior. It may concern the cervical, thoracic, lumbar or sacral portion of the spine, or in a broader embryologic view the mid-line of the skull from the nasion to the foramen magnum. There may or may not be protrusion through this defect. Whether there is protrusion or not, the defect may be covered by skin, subcutaneous tissue, and membrane, or by membrane alone. The covering may be intact, or ulcerated, or ruptured and leaking without obvious ulceration. Over the defect the covering may be flat, or rounded and sessile, or rounded and pedunculated.



CASE 4. Myelomeningocele sixteen months after operation. Small keloid-like thickening at centre of scar. At operation twenty-four hours old, with leaking sac of skin and membrane six centimeters in diameter and paralysis of feet. Paralysis cured.

When a protrusion exists, it may contain only cerebrospinal fluid (*i. e.*, a meningocele), or it may contain nerve elements and cerebrospinal fluid (*i.e.*, a hydromyelomeningocele or a hydroencephalocele), or it may in the head contain only brain over which is tightly drawn some abnormal investment without fluid (*i. e.*, an encephalocele). The nerve elements may or may not be adherent to the sac. The function of the nerve elements may or may not be disturbed. There may, however, be complete sensory and motor paralysis. For example, a spina bifida in the lumbar region may be associated with paralysis of both legs, bladder, perineum, and rectum. There will be incontinence of urine and feces, and perhaps prolapse of the rectum.

It is needless to say that the most favorable type for operation is the meningocele which is covered with intact skin, and that the simplest, from operative point of view, is the pedunculated meningocele which is covered with intact skin. In these cases, after exposing the neck of the sac, it may be found very small, permitting simple ligation. In placing such a ligature, let me caution that it be placed not too tightly. This may cause sloughing and subsequent leaking of cerebrospinal fluid. Where post-operative leaking occurs, it rarely ceases, and death usually ensues from loss of cerebrospinal fluid or from meningitis. Let me caution also that an ample fringe of sac be left lest the ligature slip. It is needless to say that in cases with sloughing sacs the danger of post-operative meningitis is increased. That it does not necessarily occur is well shown in this series. Twenty-two of the thirty-four cases had ulcerated or leaking sacs, and nine survived operation, *i. e.*, 40%.

The incision has been an elliptical one, skirting close to the membranocutaneous border in those cases which were wholly or partially covered with membrane. There were but six cases covered entirely with skin, twenty with skin and membrane, and eight entirely with membrane.

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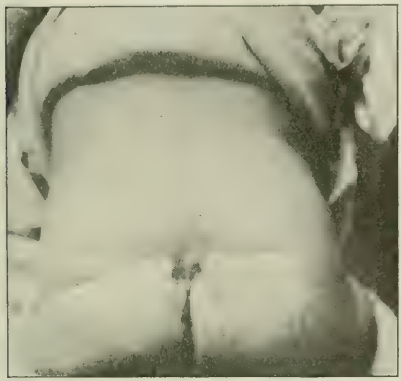
* Another case had been operated upon three days before the reading of the paper. The case, therefore, was not included in the original paper but has been added in this writing.

In all cases in the lower lumbar and sacral regions, a transverse elliptical incision was practised, whenever possible, in order to bring the closed wound as far as possible from the anus. In some cases in this region in which the longitudinal diameter of the defect exceeded the transverse diameter, a vertical elliptical incision had to be made. This is more often the case in sacs entirely covered with membrane, especially the flat type.



Case 5. Myelomeningocele. Fifteen months after operation. Small naevus persists at centre of scar. At operation, thirteen days old. Sac covered with skin and membrane, and ulcerated and leaking. Incontinence of urine and feces and prolapse of rectum. Prolapse cured. Increasing control of bladder and rectum.

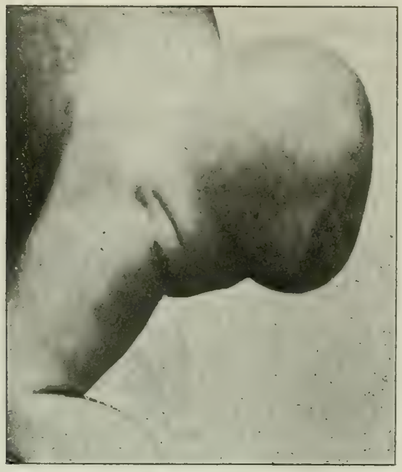
This series includes 7 meningoceles, 23 myelomeningoceles, 3 hydroencephaloceles, and 1 encephalocele. Twenty-three were rounded and sessile, 8 rounded and pedunculated, and 3 flat.

In operating on the rounded sessile type, an unexpectedly tiny communication of the sac with the neural canal may be found even in large tumors. On the other hand, although the communication between the sac and the neural canal is usually small in a pedunculated mass, it may be quite wide, occupying practically the whole pedicle. In pedunculated tumors, the consistency of the pedicle, whether firm, or soft and fluctuant, avoids surprises regarding the size of the neck of the sac. A pedicle of firm consistency probably contains a narrow neck of communication with the neural canal, surrounded by fatty tissue. A soft, fluctuant pedicle, on the other hand, probably consists almost entirely of communicating neck, with very little surrounding fatty tissue. In any case, the dissection down to the neck of the sac should be made carefully. Once the line of cleavage between the sac and surrounding tissues has been determined, the dissection may be rapidly continued circumferentially. With the sac well exposed about the laminar defect, it is best opened high on one side. The opening is cautiously enlarged to expose the interior of the sac. The opening is then extended around the sac caudad, avoiding nerves, and leaving an ample fringe of sac for closure. When the lower pole is reached, an effort is made to strip the nerves off the under surface of the sac with small moist gauze sponges from below upwards. I have found this direction easier than from side to side or from above downwards. In case the nerves can be stripped away, the dura is then closed with mattress sutures of No. 00 plain catgut. I have found that closure with mattress sutures offers greatest security against subsequent leaking. The most difficult problems in closure are offered by the flat type entirely covered by membrane. Inasmuch as this membrane has been a surface covering, I think that no part of it can be safely used for closure. The surface portion must be removed and not infolded under skin flaps. Obviously, in wide defects wholly covered with membrane, it may be impossible to close the dura after removing the surface covering. I believe operation in such cases should not be attempted. I have tried splitting the surface covering into an inner and outer lamina, preserving the former for closure. It is almost impossible to accomplish without buttonholing, which means leaving a minute portion of the outer cover or contaminating the inner lamina. Both cases have died of meningitis.

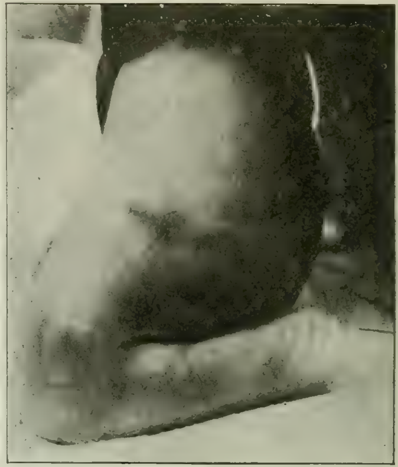
In narrower defects wholly covered with membrane, removal of the surface covering may leave dural fringes apparently too short to cover the canal. By carefully separating this investment for a little distance from the inner surfaces of the remaining portions of the laminae, closure may be effected. The dural canal is consequently made a little narrower in this region, but this may not be harmful in the region of the cauda equina. It is probably undesirable in the region of the cord.

I wish to emphasize a departure from the usual technic. In no case in this series has the laminar defect been covered with flaps of fascia. If the bony defect is caused by hyper-activity of the choroid plexuses and ependyma before bony closure of the neural canal has occurred, the success of the operation does not depend upon building up a barrier against the bony defect, but entirely on the subsequent activity of these tissues. If these have reached a stage of normal activity (*i. e.,* recovered from an early tendency to hypersecretion), then no further bulging will occur. With these premises, fascia covering is unnecessary, and the operation is appreciably shortened by omitting this step. This is very important in infants.

If the choroids and ependyma have *not* recovered from a tendency to hypersecretion, then closure with fascia, I believe, will not be effective against the increasing pressure. What occurs in such cases is not bulging at the site of operation but hydrocephalus. In only one case in this series have I seen bulging at the site of operation, and in this case there was also postoperative hydrocephalus. In no other case of



CASE 27. Myelomeningocele. Three months old.



CASE 27. After operation. Well seven months later.

continued hypersecretion after operation as shown by hydrocephalus (and there were five) did bulging at the site of operation occur. I do not regard the covering of the defect with fascia, therefore, as necessary. It may be desirable as a subsequent protection against traumatism for a weak spot. It is, however, time-consuming and increases the possibilities of infection in cases with ulcerated sacs, for the mobilization of the fascial flaps may be followed by oozing and collections of serum.

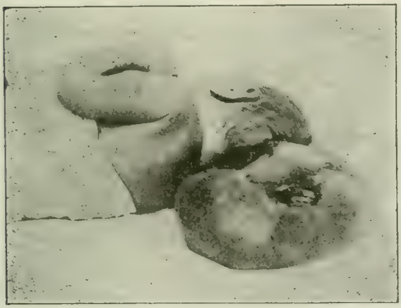
Closure of the skin without undue tension may require extensive dissection of skin and subcutaneous tissue from the fascia, even up to the lower angles of the scapulae, down over the ilia, and well into the flanks. Even then undue tension may occur at the center, but can be greatly lessened by hyperextension of the back. To accomplish this, the baby after operation is placed belly down with the pelvis and legs elevated.

Paralysis. Twenty cases exhibited some degree of paralysis. Of these, the paralysis was increased after operation in three, it was not affected by operation in nine, and improved or cured in eight. In five of these eight the benefit was unimportant, for all died subsequently of acute hydrocephalus or meningitis. However, the paralysis which they exhibited before operation was lessened or disappeared up to the time of death. Three of these cases are still living. One, Case 5, exhibited prolapse of the rectum and incontinence of urine and feces. Now, fifteen months later, there is no prolapse, and the mother is convinced that there is increasing control of bladder and rectum. Another case, Case 8, exhibited sensory paralysis of both legs, motor paralysis of right foot, and prolapsed rectum before operation. The motor paralysis of the foot and the prolapse are cured but sensation in the legs is still impaired. The third case, Case 4, presented a myelomeningocele in the sacral region, with leaking sac and paralysis of both feet when seen twenty-four hours after birth. Operation was done at once and the child is perfectly well sixteen months later.

Paralysis, therefore, cannot be due in all cases to nerve destruction. In some cases it must be due to the stretching of nerves which have become adherent to the summits of enlarging sacs. If operation is done before such stretched nerves become hopelessly incorporated in granulations at the summit of the sac, they may be freed from the sac and the paralysis cured. It is true that there may be defective development of the cord and nerves. In such cases an apparently satisfactory operation may fail to cure the paralysis. Such a condition, however, cannot be determined without operation, and it is no argument against early operation on cases with paralysis. By operating on paralyzed cases at once, nerve destruction may be forestalled and cure made possible.

Sixteen cases were discharged dead, eighteen cases were discharged alive; a mortality of 47%. Although high, it compares very favorably with percentage figures which I have found. I have seen figures giving the mortality as 75% and higher. The causes of death were shock, one; acute hydrocephalus, one; continued loss of cerebrospinal fluid, four; umbilical septicemia, one; meningitis, nine. Therefore, deducting the case which died of umbilical septicemia, the operative mortality is 44.1%. When I consider that 64.7% of the cases exhibited ulcerated or leaking sacs, I am not ashamed of this mortality. Of the cases discharged alive, four exhibited some degree of paralysis, three increasing hydrocephalus, ten were well. Of the well cases, three were myelomeningoceles, all with ulcerated or leaking sacs; four were meningoceles with intact coverings; and four were encephaloceles.

Berger has told us that brain inclusion in an encephalocele is abnormal brain tissue which he called cephaloma. He told us that this was non-functionating and insensitive. In these four cases I have amputated the brain protrusions thrice with the knife and once with the cautery, apparently without ill effect. Two brain inclusions were the size of small crab-apples, one the size of a walnut, and one the size of a kidney bean. The three hydroencephaloceles were all occipital, one the size of a walnut, one the size of a plum, and another larger than the child's head and ulcerated (Case 14). All of these children are living and well. The fourth case of this group was a pure encephalocele the size of a small crab apple, covered not at all by skin but by a tightly fitting investment of modified meninges in a child twenty-four hours old. This child was obviously an idiot and, without anaesthetic, the mass was amputated with the cautery flush with the skull. It apparently caused no discomfiture. It was thought that the procedure would terminate the misshapen little creature but she made an uneventful convalescence. I have since learned that she fortunately died three months later of pneumonia.



Case 14. Hydrocephalocele with ulcerated sac. Eighteen hours old. Brain inclusion size of ping pong ball. Amputation with knife. Well one year after operation.

The coverings of bifida sacs may be entirely skin, entirely membrane, or partly skin and partly membrane. The sacs are subject to injury. The injury may cause abrasion or immediate rupture. If abrasion occurs, it is prone to infection. Sooner or later, with or without leaking of the sac, the infection will penetrate the sac and meningitis and death ensue. If immediate rupture occurs, sudden death from sudden severe loss of cerebrospinal fluid may result. Rupture, however, may lead to death by furnishing a portal of entry for infection. It is obvious, then, that the prognosis is much worse in cases with sacs covered with membrane than in those with sacs covered with skin. The membranous cover is so apt to become infected that I believe we will all agree upon the wisdom of early operation. How early? My own feeling is that operation should be done as soon after birth as the child can be transported to surroundings suitable for operation. With a little practice in infants the worse cases can be completed in twenty to twenty-five minutes, the simpler ones in ten or twelve. I strongly advocate operating at once after birth in cases with sacs covered with membrane. By "at once," I mean within three, four, or five hours after birth. Although the large majority of cases in this series (64.7%) had infected oozing sacs, a few recovered from operation. The majority died of meningitis. I am convinced that the mortality would have been greatly reduced had these cases come to operation before ulceration and infection occurred. I have seen cases only a few hours old with ruptured sacs, and others no older with granulating and oozing sacs. Hours are important under such circumstances. In cases with ulcerated or leaking sacs operation offers a tremendously greater chance of success, if done at once. In cases with sacs covered with intact skin, operation may be deferred, but should not be long deferred in the presence of paralysis.

DISCUSSION.

Dr. John J. Thomas, Boston: This paper of Dr. Harmer's shows a large amount of careful work, and I can only commend the things he said to you. I shall not give you a long neurological discussion in regard to spina bifida, but I do want to emphasize one point to which he referred, and that is the fact that probably the best theory of the cause of spina bifida is the increased pressure of the cerebrospinal fluid before birth, that prevents the closure of the bony arches. The effect of that is the thing to which he has called attention, namely, that we see frequently hydrocephalus in connection with this. I have seen a great many of these cases that did not show the hydrocephalus at the time of operation, or even very soon after, developing rather slowly later on. This is not in itself a contraindication for operation. I think, however, it is a point which we would all do well to emphasize in our prognosis to the parents, that back of this condition is probably an increased production of cerebrospinal fluid, and if not overcome the child is very apt to develop hydrocephalus. This, of course, complicates the prospect of life and the chances of future health, if they do live.

Unfortunately, as you know, we have no very effective treatment for hydrocephalus. The giving of iodide, in my experience, is of very little use. The ventricular tap through the corpus callosum is very effectual in keeping it down, but this has to be done very frequently. The whole of the cerebrospinal fluid is probably replaced within six hours, so that in a severe case there is very little hope of maintaining the lower pressure for any length of time. The giving of thyroid extract, which Fraser has suggested, I have found to be of considerable apparent benefit in cases of hydrocephalus. I should advise men who operate on these cases for spina bifida to give thyroid extract in small doses suitable for infants, very soon after the operation is done.

Of course, in cases where there is danger of ulceration of the sac we have no choice as to the time of operation. It has to be done, and has to be done promptly, and it is much better done before the ulceration takes place. Dr. Harmer's results are fully as good as any of the others of which I know. The high percentage of failures is due not to the difficulty of operation, but the difficulty of avoiding infection, and getting firm union, and preventing leakage of cerebrospinal fluid when operating through infected areas.

The important point, from a neurological point of view, in doing these operations, I think, is to exert care in dissecting your sac out to see whether the nerves run into it. These cases, you know, are very much more frequent in the lower sacral region and the lower lumbar region than higher up. In the dorsal region, if you have paralysis, you have a defect of the spinal cord, and it makes no difference whether you remove the sac or not, your defect in the spinal cord will persist. In the lower lumbar or sacral region, if you save the nerve roots you may prevent paralysis or have improvement in paralysis. If you cut them you will produce paralysis, and this may be not from disease alone. If the nerve roots do not go into the sac, your precaution is unnecessary, and you have wasted time in trying to prevent a complication which was not likely to occur. It is very distressing when you find a child has no paralysis, and the operation is advised for the sake of having the child cared for more easily, to see it develop a paralysis because the nerve roots have not been separated. On the other hand, it is very frequent that the nerve roots run into the sac but do not run out into the nerve trunks, and the saving of them makes no improvement in the paralysis. Then you simply have a condition which you cannot remedy.

The question of the suturing of these nerve roots I think is entirely impractical. It might be done in adult life, but in a child, where it is a developmental thing, there are lesions behind these roots, and the nerve roots themselves are defective.

In regard to stimulating by electricity and dropping the sutured nerve back into the spinal canal, I think it is practically a hopeless thing. I should be glad to see some surgeon attempt it where the electrical examination gave any encouragement for doing so. The thing practically never seems to be carried out, but it should be thought of, and certainly one should always look carefully on the inner side of the membrane of the sac for the nerve roots and try not to cut them.

One other point is the fact that in all these cases of defects of the cauda equina you must remember your paralysis is of the peripheral type where we have destruction of the peripheral motor neuron, and therefore these paralyses are always of the flaccid type, with relaxation and atrophy of muscles. That was shown in one of the photographs by the lack of development of the buttocks of the child. These cords are both sensory and motor and so you have defects of sensation.

In regard to spina bifida occulta, the condition is often overlooked. If one remembers that invariably with spina bifida with paralysis you have sensory losses as well as motor, such mistakes would be more easily avoided. Remember, too, in your diagnosis that not only is the sphincter affected, in the severe cases where there is prolapse of the rectum, but where the anus is simply relaxed you can determine whether there is nerve defect before operation by looking to see whether you get the anal reflex. Prick the skin of the perineum with a pin and see whether the sphincter reflex is present. Your statement to the parents that there is nerve defect already present will save a good deal of difficulty in explaining afterwards, in cases where the trouble with the rectum persists and proves to be a troublesome and distressing symptom.

Dr. J. S. Stone, Boston: Dr. Harmer has tackled a most discouraging subject and he has obtained wonderful results in many of his cases. If he follows his cases for another ten or twelve years, however, his results will not be so good. In these cases, as I have followed them along, the primary result may be good, but sooner or later, with the paralysis of the sphincters there is lack of control of the urine, and with it more or less paralysis of the bladder with residual urine, and ultimately death from urinary infection.

This is one of the discouraging things that will happen, but is not a contraindication to operation.

Another thing which Dr. Harmer stated perfectly frankly was that he operated at first on all cases. I think that everyone who does much of this work will sooner or later come to recognize that certain cases had better not be operated on. That is, not from any selfish point of view, but there is nothing to be gained; and I think that all of us must recognize that it is harmful to surgery to do operations in which nothing can be gained. We must also recognize that in all probability there will never come a time when anything can be gained in some of the more severe cases.

Dr. Thomas spoke of spina bifida occulta. There is a group of the anterior spina bifida cases that do not have any tumor which shows posteriorly. There are a great many which come into the hospitals and are under the observation of the most careful men in whom the true condition is not thought of. In any case where there is either retention of urine or incontinence of urine, which is not explained, spina bifida occulta is always to be thought of. That condition can be practically diagnosed without an x-ray from those conditions, if there is any abnormal irregularity to be felt in the spinal column posteriorly, if there is a median line lipoma, or if there is a localized area of exaggerated growth of hair over the spine. By this I mean a diamond-shaped area of hair, say an inch and a half long, in any part of the spine. With any localized paralysis or any hitch in the gait, spina bifida occulta is something which is always to be thought of. Of course, the condition cannot positively be diagnosed without an x-ray. In some of the cases of spina bifida occulta where the tumor is in the thoracic region, and where there may be a large tumor, I have known of the diagnosis of asthma, from the difficulty of respiration. The particular case which I have in mind had an enormous spina bifida occulta which practically filled one side of the chest, which had been tapped repeatedly.

In regard to operative procedures, the chief danger is the danger of meningitis, and meningitis may occur either with or without operation. Meningitis may occur through a membrane that is practically intact, without any definite leakage.

That I have seen repeatedly. And we do not want to confuse leakage of cerebrospinal fluid from the spinal canal with the little droplets that will appear in the upper central part of the ulcerated area, which come from the open central canal of the cord. Where there is an ulcerated area, if you look carefully in the median line toward the top you will almost invariably see a minute hole, and if you watch it long enough you will find a little droplet oozing from that as sweat comes from a sweat gland. If you figure the thing out you will see how the hole comes there embryologically.

There is a definite danger of death from meningitis after operation, and also the danger of death from sudden leakage. If the utmost care is not taken through posture and in every way to prevent excessive leakage at the time of operation, the results are, within twelve hours, an excessive rise of temperature. For instance, it may happen in a case operated in the morning, that in the evening the temperature may go to 106° or 110°. Then there is the danger of leakage around stitch holes, which not necessarily always, but sometimes, adds tremendously to the danger of death from meningitis. The third danger is the danger of hydrocephalus. When we take away the spina bifida in many of these cases we take away the safety valve. The operations which have been devised for the cure of hydrocephalus are operations which try to bring the cerebrospinal fluid into communication with a large area of fat, whether subcutaneous fat or retroperitoneal fat. Where we have a spina bifida we have that condition existing. We have the meninges coming out, spreading out, and lying in contact with this large area of subcutaneous fat, so that there is that safety valve. There is a chance for the cerebrospinal fluid to pass out from this big tumor into the subcutaneous tissues, and there is a balance struck between the secretion and the absorption back again into the subcutaneous tissues from the spina bifida; and when we cut off the spina bifida we take away the safety valve, and the head fills up.

I agree absolutely with Dr. Thomas that we must use the utmost care in saving any nerves that we can. And in answer to Dr. Harmer's question, I would say that I personally have not any one method of choice, but I believe in simply saving them in the best way possible, and I think usually the best way is to open where there are no nerves, and then work from the inside, rather than trying to work from the outside, because we can see better on the inside than on the outside.

I think Dr. Thomas emphasized one point which is very important, and that is, always look at the perineum. Whenever there is any paralysis it is bound to show there. It may show elsewhere, but always in the perineum.

Report of Results of Radium Treatment at the Collis P. Huntington Memorial Hospital by the Cancer Commission of Harvard University.

By William Duane, Ph.D., Boston,
and
Robert B. Greenough, M.D., Boston.

The treatment of cancer and allied conditions by radium has now (June, 1917) been in operation at the Collis P. Huntington Memorial Hospital for a sufficient length of time to permit conclusions with regard to its value to be formulated. Radium was first employed here in September, 1913, and from that time to the present day has been the main interest and activity of the clinical work carried on by the Cancer Commission.

The chief responsibility for this work must be accorded to Dr. J. Collins Warren, Chairman of the Cancer Commission of Harvard University. Dr. Warren early saw the necessity for an independent and unbiased investigation of the value of the many therapeutic agents advocated from time to time as "cures" for cancer, and it is due entirely to his wise foresight, his unlimited enthusiasm, and his untiring effort that the hospital was established, and the clinical work of the Commission begun on a broad basis of scientific accuracy, and with resources sufficient to maintain these standards. During this period a number of different individuals have taken a part in the work, but owing to the very complete system of records and clinical notes established by the first Physician-in-Charge of the Hospital, Dr. Thomas Ordway, the data obtained are now available for study, and the results can be accumulated and stated with a considerable degree of accuracy. The hospital was opened during the period when Dr. E. E. Tyzzer was Director of the Cancer Commission, and he took a large part in the organization of the work, as well as the more definite responsibility for the pathological work, the reports of autopsies and the examination of clinical pathological material. The work with radium began in September, 1913, with the appointment to the Commission of William Duane, Ph.D., Research Fellow in Physics. Dr. Duane has had charge of the preparation and measurement of the radium, and of the details of its practical application to treatment of the cases adjudged suitable for radium therapy. In addition to Dr. Tyzzer, Dr. Ordway and Dr. Duane, a number of others have had a share in the collection of the data on which this report is based: Dr. Ellis Kellert and Dr. George Benet, resident physicians; Dr. Henry A. Christian and Dr. Francis Peabody, consulting physicians; Dr. J. Lucien Morris, Dr. F. S. Hammett, Dr. Henry Lyman, chemists; Dr. W. J. Kerr, Dr. Carl T. Harris, Dr. Clarence T. Hyman, house officers; Dr. Edward H. Risley and Dr. Channing C. Simmons, assistant surgeons; Dr. George A. Leland, Jr., Out-Patient surgeon; Dr. A. A. Ghoreyeb, Research Fellow in Pathology; Miss Irene W. Mason and Miss Anna Gibson, matron-superintendents of the hospital; and many consultants in special lines of clinical work, including Drs. Harvey Cushing, C. A. Porter, D. Crosby Greene, Harris P. Mosher, E. A. Crockett, W. P. Graves, George Derby, C. J. White, as well as Dr. Robert B. Greenough, Surgeon-in-Charge of the Huntington Hospital. All of above-mentioned persons have in some degree contributed to the accumulation of the material upon which this report is based.

The present organization of the hospital work is as follows: A patient is referred to the hospital by his own physician, or by another institution. Application cards are furnished with blanks for the principal data which it is desired to obtain. The patient is then examined with a view to the diagnosis and the question of whether or no radical operative treatment is a possibility. When the opinion of a consultant is needed the services of the members of the different departments of the Harvard Medical School are freely called upon, and have been most generously given. With the exception of certain minor superficial lesions of the non-metastasizing type, it has always been the policy of the hospital in operable cases, to advise operation, and to withhold radium or other non-operative treatment. If operation is considered advisable the patient is referred to one of the larger hospitals, or returned to his own physician with this opinion. A few cases have been received at the Huntington Hospital for radical operation, but they are taken only for special reasons, and are the exceptions to the general rule.

Pathological reports in confirmation of the diagnosis of cancer are sought in every case. In the cases of post-operative recurrence of cancer, the pathological report upon the tissue removed at operation can usually be obtained. In advanced inoperable and ulcerated cases, a fragment of tissue to confirm the diagnosis can usually be secured with the curette, without undue danger of spread of the disease. Where the tissues are unbroken, however, it has been the policy of the hospital to refrain from employing the exploratory excision of fragments of tissue, on the ground that the danger to the patient of artificial spread of the disease outweighed the advantages of a certain diagnosis. This rule has been broken, advisedly, from time to time, but only on rare occasions.

If the case is one which is considered suitable for radium treatment, the matter is discussed with Dr. Duane; the details in regard to dosage, screening, distance, duration and frequency are determined, and treatment is begun. Special methods of application are devised for special cases, and the progress of the case is followed both by the radium expert, and by the surgeon. Data, consisting of measurements, photographs, tracings, etc., are made, and the record is continued. No case is discharged "cured" or otherwise, until terminated by death. A follow-up system, under Miss Ruth Symonds, the Social Service Worker of the hospital, has yielded excellent results in tracing up "lost" cases. From April, 1912, till January 1, 1916, out of 1080 cases, the end-results (to within six months) were known in all but 39.

It has been the policy of the hospital to restrict the use of radium to patients that could be brought to the hospital to be cared for by the staff; only in this way can the full benefit of the radium be secured to the patient, and the full benefit of the data obtained secured to the Commission.

In reporting the results of the use of radium in the treatment of cancer, some preliminary statements are advisable. When the first reports of the therapeutic use of radium were given out, a lapse of time sufficient for an unbiased and definite conclusion as to its benefits had not occurred. In certain clinics, also, the customary data for the surgical diagnosis of malignant disease in its different situations were not always obtained, and evidence in support of the statements that the cases treated were actually cancer was not provided. The sensational publications in the lay press relating to the wonderful effects of radium therapy, and the dramatic and interesting physical phenomena of radioactivity, all helped to rouse in the public, and among the profession at large, an expectation of brilliant results far in excess of what the facts now actually seem to warrant. Again, the obviously extravagant claims of some of the earlier exponents of radium therapy served to arouse in the more conservative members of the profession a natural pessimism, which led them to distrust its value altogether. As a fact, the real truth lies somewhere between these two extremes. Radium is not a cure for all kinds of cancer. There are many cases of cancer in which it can be said to be of no material benefit; but there are also many cases where its use prolongs life, relieves distressing symptoms, improves the general condition and the functional activities of the patient, and mitigates, as does no other agent which we have employed, the gradually progressive symptoms of advancing incurable cancer. There is a small group of cases of cancer where treatment with radium has apparently, so far as our observations extend, been capable of eradicating the clinical manifestations of the disease. It would be premature to use the word "cured" in this connection, as the time elapsed is not sufficient to conform to the arbitrary three or five year limits commonly accepted in surgical literature, which are admittedly themselves time standards too brief to cover the infrequent but well-established cases of late recurrence. This group of cases includes the more superficial and less rapidly metastasizing forms of carcinoma, together with a few cases of the deeper and generally more serious types of disease which appear to be, for some unknown reason, individually more susceptible to radiation than the usual cases of the same character. In the large group of cases in which radium has marked beneficial effect as palliative treatment, and in the smaller group in which its effects are more permanent and complete in eradicating the clinical signs of the disease, radium has already justified the very considerable outlay necessary for its purchase, and the further difficulties and dangers of its effective administration.

The 1080 cases included in this report are those which entered the hospital in the twenty-eight months from April, 1912, to January, 1916. Radium was not used for treatment here until September, 1913, but it was then applied to many of the cases which had entered the hospital before that time. 642 of the 1080 cases received radium treatment. The arbitrary date of January, 1916, was established in order that at least a year might have elapsed in every case reported before the results of treatment were assembled for study. The end results given, however, are carried up to date (January, 1917), and represent the results at periods from twelve to forty months after treatment was begun—an average of two years and two months.

During the period of time mentioned the Commission has been using only 235 milligrams of radium. This amount has since been greatly augmented through the kindness of friends of the University.

The tabular list of cases is as follows:

Carcinoma (A)			
Buccal Cavity (39A)			
Lip		39	
Palate		8	
Jaw (lower)		36	
Jaw (upper—antrum)		11	
Tongue and floor of mouth		33	
Tonsil		7	
Cheek (buccal surface)		5	
TOTAL			139
Stomach, Liver, etc. (40A)			
Oesophagus		12	
Pharynx		9	
Gall-bladder and liver		2	
Pancreas		1	
Stomach		16	
TOTAL			40
Peritoneum, etc. (41A)			
Peritoneum and omentum		2	
Intestine (colon)		5	
Rectum		9	
TOTAL			16
Urinary Organs (45A)			
Bladder		3	
TOTAL			3
G.-U., Male (45A)			
Prostate		5	
Penis		2	
TOTAL			7
G.-U., Female (42A)			
Vagina		6	
Uterus		91	
Ovary		12	
Clitoris		1	
Vulva		2	
TOTAL			112
Breast (43A)			
TOTAL			143
Skin, Face, etc. (44A)			
Carcinoma		83	
Epidermoid carcinoma		58	
Rodent ulcer		34	
"Epithelioma"		21	
TOTAL			196
Other Sites (45A)			
Thyroid		7	
Neck glands		14	
Larynx		15	
Glands of groin, axilla, etc		5	
Parotid		2	
Nasal mucosa		3	
TOTAL			46
Sarcoma and Allied Tumors (F)			
Bone		16	
Soft parts		22	
Melanotic		8	
Endothelioma		2	
Brain tumor		9	
Myeloma		1	
Mixed tumors		4	
Hypernephroma		4	
TOTAL			66
Benign Tumors			
Papilloma		31	
Miscellaneous		10	
Breast		5	
Keloid		9	
Naevus		15	
TOTAL			70
Miscellaneous Conditions			
Keratosis senilis		33	
Tuberculosis		11	
Syphilis		11	
Lupus erythematosus		6	
Leukoplakia		8	
Leukaemia	Lymphatic 7 Myelogenous 22	29	
Lymphoma		40	
Effects of radium		9	
Deafness		11	
Apprehension		14	
Fibrosis penis		3	
Miscellaneous diseases (not radium)		53	
Skin lesions—miscellaneous		6	
Chronic inflammatory diseases		3	
No diagnosis		5	
TOTAL			242
GRAND TOTAL			1080

Certain groups of cases of cancer of special organs or regions have been allotted to different members of the staff for analysis. These more detailed analyses will be published under separate titles. It will be sufficient in this introductory statement to formulate briefly the general estimate which has been formed of the value of radium treatment of cancer in its more common and important situations, and the evidence in support of these conclusions.

39A—CARCINOMA OF THE BUCCAL MUCOUS MEMBRANES—139 CASES.

(a) Cancer of the lip, 39 cases; 19 treated with radium; 4 with complete success; 4 with improvement, and 11 with no benefit. Squamous cell carcinoma in this situation is resistant to radium therapy. When the disease has metastasized to the regional lymph nodes no marked benefit from radium has been observed. Local recurrence, however, as in other superficial situations, can be affected favorably. It is our opinion that a grave responsibility rests on those who advocate radium treatment in preference to operation for cancer of the lip, in even its early stages.

Cancer of the palate, 8; tonsil, 7; buccal mucosa, 5; lower jaw, 36; upper jaw, 11; tongue and floor of mouth, 33—100 cases in all. Sixty-two of these received one or more treatments with radium; nine obtained some benefit from treatment. In the others the course of the disease was not materially affected. The best results were obtained in the cases of recurrent cancer of the jaw, where a neck dissection, performed at the time of the original radical operation, served to delay, if not to prevent, the glandular extension of the disease. In one such case local recurrence at the site of the original lesion on the jaw was destroyed with radium, and there has been no return of the disease in sixteen months. As a result of this experience we have recently treated a number of cases of otherwise inoperable mouth carcinoma by a primary neck dissection and subsequent radiation of the local tumor, and we are encouraged to hope that this method may prove effective in a certain number of cases not otherwise amenable to treatment.

40A—CARCINOMA OF STOMACH, LIVER, ETC.—40 CASES.

(a) Carcinoma of the esophagus, 12 cases. Five received radium treatment, and of these one obtained some relief of symptoms, although no permanent good was accomplished.

(b) Carcinoma of the pharynx, 9 cases. All treated with radium, and with no material benefit with the exception of one case which showed temporary improvement under prolonged treatment.

(c) Carcinoma of the gall-bladder, 1; pancreas, 1; and liver, 1—3 cases. The gall-bladder case and the pancreas case both received radium treatment, without notable improvement.

(d) Carcinoma of the stomach, 16 cases. Only one received radium treatment, which was given three times, with psychic, but no obvious physical benefit to the patient.

41A—CARCINOMA OF THE PERITONEUM, ETC.—16 CASES.

(a) Carcinoma of the peritoneum and omentum, 2 cases. No benefit from radium.

(b) Carcinoma of the intestine, 5 cases. Two cases were given radium without benefit.

(c) Carcinoma of the rectum, 9 cases. In 5 radical operation was advised; 3 accepted this advice, and 2 of these are well four years and eight years* after operation; 3 received radium treatment, with but slight, if any, improvement in their condition.

45A—CARCINOMA OF THE URINARY ORGANS—3 CASES.

Carcinoma of the bladder, 3 cases. Two received radium treatment, and 1 obtained some relief and is still under treatment.

45A—CARCINOMA OF THE MALE GENITO-URINARY ORGANS—7 CASES.

(a) Carcinoma of the prostate, 5 cases. Four received radium treatment. All are dead, but one of these obtained definite, but temporary, relief.

(b) Carcinoma of the penis, 2 cases, of which one was advised to undergo operation, and the other received radium treatment without benefit.

42A—CARCINOMA OF THE FEMALE GENITO-URINARY ORGANS—112 CASES.

(a) Carcinoma of the vagina, 6 cases. Four received radium treatment; all are dead, the average duration of life being six months from the time of beginning treatment.

(b) Carcinoma of the vulva, 2; clitoris, 1—3 cases. All received radium. In none has there been marked benefit from treatment.

(c) Carcinoma of the uterus, 91 cases. These cases form the basis of a special report by Drs. E. H. Risley and G. A. Leland, Jr., covering the period up to June, 1916, bringing the number of cases to 113. Ninety of these cases received radium treatment, as follows:

Group 1. Cases considered inoperable, and treated with radium, improved enough to justify radical operation: 5 cases; 3 living, 2 without recurrence at twelve and eighteen months after operation, and 1 case free from recurrence for two years after operation, then local recurrence, and now under treatment.

Group 2. Cases received for prophylactic treatment after radical hysterectomy: 5 cases; 2 free from recurrence twelve and fifteen months after operation; 2 recurrent cases, and 1 untraced, but free from recurrence eight months after operation.

Group 3. Recurrence after hysterectomy, 37 cases: 1 apparently free from disease; 2 doubtful, 5 living with recurrence, and 26 dead.

Group 4. Recurrence after curette and cautery: 21 cases; 4 living with recurrence and under treatment; 1 living and without evidence of disease nineteen months after beginning treatment, but since then untraced.

Group 5. Inoperable cases: 22; none free of disease. Average duration of life after beginning radium, twenty-two months.

Of the 91 cases, 5 living and apparently free of disease, six, twelve, twelve, fifteen and eighteen months after beginning treatment; 2 living and apparently free from disease eight and nineteen months after beginning treatment, but since then untraced. Of the 7, 2 were being treated on a prophylactic basis, and showed, after operation, no evidence of recurrence. The other 5 were recurrent or inoperable cases.

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* Entered Collis P. Huntington Memorial Hospital for suspected recurrence, which did not exist. Original operation by Dr. C. A. Porter, 1909.

(d) Carcinoma of the ovary, 12 cases; five received treatment with radium in varying amounts; 1 case showed temporary improvement, and died fifteen months after beginning treatment; the others showed no marked improvement under radium.

43A—CARCINOMA OF THE BREAST—143 CASES.

Radical operation was advised in 14 cases and accepted in 11 cases, 8 of which show no evidence of recurrence to date; 49 cases received radium, and 27 received x-ray treatment; 3 of the radium cases showed definite local improvement, but the internal progress of the disease was not affected. It is our opinion that x-ray treatment with massive doses offers more than radium in the palliative treatment of recurrent cancer of the breast.

45A—MISCELLANEOUS CARCINOMA—46 CASES.

(a) Carcinoma of the thyroid, 7; parotid, 2; axillary glands, 1; glands of groin, 2; cervical glands, 14; nasal mucosa, 3—29 cases. Nineteen received radium; only one of these cases, a carcinoma of the nasal mucosa, is apparently relieved of his disease. In all of the others the progress of the disease was not materially affected.

(b) Carcinoma of the larynx: 15 cases; 7 received radium treatment, and all are dead, although temporary improvement was observed in two cases.

44A—CARCINOMA OF THE SKIN, FACE, EARS, HANDS, ETC.—196 CASES.

Carcinoma, 83; epidermoid carcinoma, 58; rodent ulcer, 34; "epithelioma," 21. It is in cases of this superficial type that radium produces its most marked and beneficial therapeutic effects. Of the first group, carcinoma, 33, or 39%, show no evidence of return of the disease. Eight cases were operated upon without recurrence, and only 10 cases, or 12%, failed to obtain definite benefit from radium treatment. Of the 58 cases of epidermoid carcinoma, 15, or 25%, were relieved of all evidence of their disease, and only 9 cases, or 15%, failed to show definite benefit from radium treatment.

Of the 34 cases of the rodent ulcer (basal cell) type of carcinoma of the skin, 12, or 35%, were relieved of all symptoms, and 6 cases, or 17%, showed only temporary benefit, or none at all.

Of the 21 cases of "epithelioma," 9 were permanently relieved, 44%. Only one case obtained no benefit, and in one the benefit was only temporary.

To sum up these 196 cases of superficial carcinoma of the skin, in 69, or 35%, the disease was apparently destroyed, and in only 27, or 14%, did it appear to be so little affected by radium that the patient obtained no benefit. In all of the other cases improvement was manifest, although in a limited number of cases the disease recurred after apparent destruction by radium, and is again under treatment.

F—SARCOMA.

Bone, 16 cases; soft parts, 22; melanotic sarcoma, 8—46 cases.

Bone sarcoma, 16 cases; 3 treated with radium, of which 1 showed no improvement, 1 slight improvement, and 1 apparently relieved of all evidence of the disease.

Sarcoma of soft parts, 22 cases; 9 treated with radium—4 showed no improvement, and in 5 slight palliative benefit was obtained.

Melanotic sarcoma, 8 cases; three treated with radium with some benefit, but no permanent results.

MISCELLANEOUS TUMORS.

Endothelioma, 2; brain tumor, 9; myeloma, 1; mixed tumors, 4; hypernephroma, 4—total, 20.

In this miscellaneous group of tumors no material benefit from radium has been observed.

BENIGN TUMORS.

Papilloma, 31 cases. These occur in two groups: the papillomata of old persons, associated with keratoses, 25; and those of younger persons, 16. In old people papillomata are readily susceptible to radium treatment. Twelve of the 25, or 48%, were destroyed by radium, and 5 by caustics. Of the other group, only 2 were subjected to radium, and both of these successfully.

Keloid, 9 cases. Seven treated by radium, and all with benefit, although prolonged treatment may be necessary, and a strong application, made sufficient to cause a superficial burn, the fibrous tissue of keloid can be made to disappear with radium, leaving a flat and atrophic scar. The process is painful, but reasonably sure.

Naevus, 15 cases. Ten treated with radium, and all with benefit. Here long-continued mild treatments are required, but with perseverance the common port wine mark, as well as more prominent cavernous angiomata, can be made to diminish in color and size, and become less conspicuous.

MISCELLANEOUS CONDITIONS.

Leucoplakia Buccalis, 8 cases. Four treated with radium. The common superficial cases of leukoplakia can be made to disappear with radium. The process, however, is painful, as a superficial burn is required to eradicate the disease. It is to be advised only in the more productive cases, where the tissues are heaped up in papillary masses, and for the simple milky glossitis type, fulguration, as carried out by Dr. C. G. Mixter, has, in our opinion, proved most effective.

Leukemia, 29 cases. Lymphatic, 7; myelogenous, 22. These cases form the basis of a special report by Dr. Francis Peabody. The lymphatic cases have shown themselves resistant to treatment with radium, while those of the myelogenous type almost invariably show beneficial effects from radiation of the spleen. The blood picture returns toward, if not to, normal, the spleen shrinks, the red blood cells increase, the patient's general health and strength improve, he gains weight, and he is often able to resume his regular occupation. It is rare, however, for the myelocytes entirely to disappear from the blood smear, and the disease is subject to remissions and recurrences. It would be premature to claim anything more permanent than a temporary remission of symptoms as a result of radium treatment, but this temporary remission appears to be more lasting and more certain than that obtained by other methods of treatment which have been advocated for this disease.

Lymphoma, 40 cases. These cases form the basis of a special report by Dr. C. C. Simmons and Dr. George Benet. Twenty-one of these cases received treatment with radium. Of this number, 18 were cases of typical Hodgkin's disease, 1 was lymphosarcoma, and 2 were malignant lymphoma in situations other than in the lymph nodes. In the 18 cases of the Hodgkin's type, radium treatment almost invariably produced marked regression of the lymphomatous glands, with shrinkage of the tumor masses, and improvement in the general condition. The regression was most marked in the more accessible glands (neck) and was not obtained in the deeper lesions (mediastinum). Furthermore, the regression was almost invariably temporary, and sooner or later recurrence of the disease took place. It is our belief that more persistent and heavier treatment, especially of the mediastinal glands, may yield more satisfactory results. Of the lymphosarcoma group, one case, although glands are still present, has received marked benefit from radium treatment, and is now in good condition eighteen months after beginning treatment. Of the 2 malignant lymphoma cases, both have apparently obtained a disappearance of their disease,—one of the palate and one of the rectum. The palate case recurred, but the recurrence also disappeared, and the case is now thirty-three months without recurrence. The rectal case has been free of disease for twenty-four months.

It would appear that tissue of the lymphoma type was especially susceptible to the action of radiation, and the use of radium in such cases is to be advised.

Keratosis Senilis, 33 cases. One of the lesions most amenable to radium treatment. Twenty cases, or 60%, were relieved of the disease, one case recurred and received further treatment, and only two proved entirely resistant to radiation. One or two mild applications are usually sufficient to eradicate the lesions, without the production of a burn, or, indeed, any material discomfort to the patient.

SUMMARY.

As a result of the use of about 235 milligrams radium in the treatment of 642 cases of cancer and allied conditions at the Collis P. Huntington Memorial Hospital, from September, 1913, to January, 1916, the following conclusions are justified.

1. Many cases of advanced, inoperable or recurrent cancer may be given benefit by treatment with radium.
2. In such cases the relief may include one or more of the following advantages: Relief of pain, diminution of discharge, rendering discharges less offensive, relief of hemorrhage, diminution in the size of tumor masses, even to their total disappearance; and the improvement in the general condition of the patient. To these must be added the undoubtedly beneficial psychic effect upon the patient.
3. In a very small number of advanced and apparently inoperable cases, improvement may occur such as to permit a radical operation to be performed.
4. In a certain proportion of cases of superficial non-metastasizing types of cancer (about 35%) and in a much smaller number of cases of metastasizing cancer, radium is capable of destroying the clinical manifestations of the disease. Time has not elapsed sufficient to report these cases as "cured," and they are being kept under observation. In a limited number of cases, recurrence, after apparent destruction of the lesion, has taken place. In certain situations, as on the eye-lids, radium treatment of these lesions is to be preferred to operation.
5. In keratoses, papilloma and other benign skin diseases regarded as "precancerous," radium is effective in destroying the clinical manifestations of the disease in from 48 to 60% of cases.
6. In myelogenous leukemia, the beneficial effects of radium are pronounced, and although recurrence of symptoms may take place, the clinical advantages of radium therapy are very marked.
7. In malignant lymphoma, lymphosarcoma, and Hodgkin's disease, the lesions appear to be especially sensitive to radiation, and definite, though temporary, benefit is obtained. When in accessible situations, it would appear that the disease could be controlled by radiation for a considerable period of time.
8. In the treatment of many other tumors and diseases radium has been used with benefit depending largely upon the extent of the disease, its depth in the tissues, and the practical ability to apply sufficient radiation to modify

or destroy tissue or tumor growth. Among the conditions in which radium treatment has proved of special value may be mentioned: recurrent or inoperable carcinoma of the cervix, or of the body of the uterus, Hodgkin's disease and malignant lymphoma, myelogenous leukemia, inoperable squamous cell carcinoma of the tongue, jaw and buccal mucous membranes, in non-metastasizing epidermoid cancer and in the more benign lesions of keratoses, papilloma, and other so-called precancerous conditions.

9. Radium therapy has proved, so far, to be of little benefit in recurrent carcinoma of the breast, carcinoma of the stomach and intestine, carcinoma of the glands of the neck, by extension from cancer of the tongue, mouth and lip, and in general in deeply seated metastatic extension of cancer from any region.

10. The use of radium in prophylaxis of recurrence after radical operation, for the cure of cancer, is not advised. Where serious doubt exists as to the complete removal of the primary tumor, and where the location of the suspicious area is superficial and accessible, and of small extent, radium may be used with benefit, but where a large area is to be considered, as after operation for breast cancer, the difficulties of covering the whole area with sufficient radiation are such that the treatment is not to be recommended.

11. The combination of radium therapy and operation, by which a tumor, otherwise inoperable, is excised as thoroughly as possible, the remaining tissues cauterized, and subsequently subjected to radiation, has yielded satisfactory results in several cases. This method of procedure is especially adapted to the more advanced cases of rodent ulcer, involving the face. After a period of radiation and observation of the open, granulating wound, extending over several months, secondary plastic operations have been performed to close the defects, and the results, up to the present time, in a very small number of cases, have shown no return of the disease.

12. Of 642 cases treated with radium in this series, 354, or 55%, received definite benefit.

13. Although many cases of advanced carcinoma show no appreciable benefit from radium treatment, it is also true that in no case yet observed has radium appeared actually to accelerate the growth of tumor tissue. Patients have suffered pain and inconvenience from the effects of radium burns in certain instances, but these have been of a temporary character. The constitutional effects of heavy doses of radium are unpleasant, and severe nausea and depression may occur; but these, also, are chiefly temporary in character. With continued and excessive dosage, very profound constitutional effects may be obtained. A serious diminution in the number of white cells in the blood is observed after continued heavy dosage. This is a more lasting phenomenon, and may be of serious importance in relation to the patient's resistance to infection. On this subject we are not, as yet, ready to report. In no other respect have we found radium to exert an unfavorable action upon the patient.

14. The considerable expense of purchase and the difficulties and dangers of administration of radium therapy are more than justified by the results obtained.

MESOTHORIUM AND COMBINATION METHODS IN THE TREATMENT OF CANCER.

BY F. D. DONOGHUE, M.D., BOSTON.

THE late Professor Czerny, who inspired the erection and conducted the first cancer institution in the world, where all cases of cancer were looked upon as hopeful, in reply to a critic, made the following answer:

"Only slowly can the seed ripen which experimenters and therapeutists have planted in the ground, to mature slowly the fruit of a chemico-therapy of cancer. Under many barren stones are to be found here and there kernels of gold, which possess permanent value. A careful and experienced chemist is required to separate the true gold from the dross."

In our treatment of cancer, we have looked too enthusiastically forward to a specific for cancer, The effort to combine and correlate the various methods of proven value is a comparatively new thing. The results of the Huntington Cancer Hospital show how much may be accomplished in a well-conducted institution.

The standpoint from which I speak is the standpoint of the practitioner without a large institution, but who is willing to learn, from institutional experimentation, that which is best and safest for private practice.

There is undoubtedly a large group of cases of malignant disease which are hospital cases, but the general surgeon in the general hospital still ignores the possibilities of therapeutic means other than surgical, and the special hospital is apt to get only such cases as are looked upon as hopeless and incurable by the surgeon in the general hospital.

The inadequacy of surgery alone in controlling cancer is manifest.

That no satisfactory method for the treatment of cancer has yet been determined is evinced by the number of curative methods which have been devised, and which are in use. I do not think it can be said that the early removal of all cancers is the surest and best method of treatment, nor can it be said that surgical removal of cancer does not still deserve the most prominent place in treatment.

The results of operative treatment of cancer, however, are painfully disappointing, and while here and there brilliant results are obtained, on the whole the large per cent. recurring after operation is discouraging.

With the advance in surgical skill and diagnostic ability, we should naturally expect a decrease in the death rate from cancer.

Enough has been accomplished by ray therapy, in the form of x-ray, radium ray and mesothorium rays from radioactive substances, such as radium and mesothorium, to warrant a careful consideration of their value as an adjunct to surgery in what still may be called operable cases, and a substitute in those cases in which it is obvious that surgery is bound to fail.

Chemotherapy for cancer is not a new thing, for it dates back to the beginning of medicine, and almost every drug or chemical has at some time had its advocate, and modern experimental chemotherapy could have developed only as a result of this older work.

A statement made by the late Dr. Paul Ehrlich "that the principle governing successful treatment of parasitic disease is that parasites are killed only by those materials to which they have a certain relationship by means of which they are fixed to them."

Based upon this, Ehrlich discovered in "606," a substance that caused the disappearance of tumors due to syphilis.

The substances which have served as of some value in cancer therapy are largely of the heavy metal series. Of these arsenic, in its various forms, is the most favored. Atoxyl and salvarsan have been tried, and before the war put a stop to exchange of scientific ideas and experimentation, selenium was much exploited.

In this community, we are familiar with the routine and the results obtained by Dr. George W. Gay in the use of the compound tincture of iodine after operations, and in hopeless recurrences.

The first advocates of ferment therapy,—Susluna, Macini, Bouchut and Pean advised the injection of gastric juice or pepsin directly into the tumor. Shaw, McKenzie and Beard advocated the use of trypsin.

Various workers have injected animals with emulsions of cancer, but substantially all such have been failures as for being of value in the treatment of human cancer.

A reason for the conspicuous failure may be found in the false hypothesis on which this work was based.

Vaccination in cancer therapy has been found to have a definite effect in animals against transplant tumors, and apparently also cures growing transplanted tumors. "These facts do not seem to apply to subcutaneous tumors." (*Journal Amer. Med. Assn.*, Aug. 31, 1912. Reference, "Vaccination in Cancer," *Ztschr. f. Immunitatsforsch.*, 1912, xiii, 524.)

The works of Percy in the use of low degrees of heat in the treatment of cancer of the uterus have been interesting along the line that if the gross mass could be destroyed, the patient's natural defensive forces would take care of the present and future metastases, but he looks to massive doses of x-rays delivered through the medium of the Coolidge tube, as an important method in cases inaccessible to the knife and in the control of recurrences.

Can it be said that extensive mutilating operations are justified without an attempt to limit the growth or to cause an autolysis of the growth before operation is made?

Surgery alone, ray therapy alone, or chemotherapy alone, is not as satisfactory, and will not produce as good results, as a properly considered combination of these methods.

A surgeon, if he is to conduct the care of this specialized line of work, must be familiar with the kind and character of an operation which will be most favorable for future treatment, if he finds his case is inoperable, especially malignancy in the abdominal cavity.

There is great difficulty in controlling certain types of cancer cases, especially of recurrences, unless they are cared for in an institution. Where there is any extensive recurrence, it is a case for an institution, where intensive treatment may be followed, and where, in the present state of doubt as to the therapeutic efficiency of any method, careful observations and records may be made. The Huntington Hospital is of especial value to us from this standpoint.

Realizing our surgical limitations for more than ten years, I have looked for therapeutic aids.

One of my early cases in 1907, a case which I treated in conjunction with Dr. Alonzo K. Paine of Boston, and in which the x-ray treatment was carried out by Dr. Francis H. Williams, to whom we owe so much, endeavored to add to surgery of inoperable abdominal cancer, the method of providing free drainage from the cancer; to lower the resistance of the cancer cell by hard x-ray; and then to digest out the weakened cells by a solution of hydrochloric acid and pepsin corresponding in strength to the gastric juice.

In 1910 I had an experience with a case of extensive lymphosarcoma of the groin, which was refused by the City Hospital as inoperable, and which I operated upon August 23, 1910, assisted by Dr. Harry M. Chase, who has kept track of the case ever since. In that case, by reason of the tremendous swelling and the extensive disease, the scrotum with testicles was removed. The post-operative treatment was increasing doses of arsenic, and that case still remains well. Experiments in castration for mouse tumor, followed by resorption of the tumor, and in the removal of the ovaries as a palliative in inoperable breast cancer are interesting in connection with this case.

Werner, in July, 1912, called attention to the similarity of the effects of injected choline to x-ray and radium treatments noted in the experiments at the Heidelberg Cancer Institute since 1904. In these experiments, he was assisted by the late Dr. Stephen Szécsi, and without reviewing their experiments, they found that the injections of borocholine, whether made subcutaneously, intramuscularly or intravenously, were followed by definite resorption of tumors in mice. Werner recognized the great biologic difference between animal and human tumors, but since the injections were non-poisonous and caused no constitutional effects except some slight pain, the use of borocholine on humans was begun and continued, in conjunction with ray therapy and such surgery as was possible, up to the time the war stopped their activity.

Their methods interested me and I studied them in 1912, 1913 and 1914.

Perhaps I should here disclaim any originality in the work on cancer. As a practising surgeon, doing private work only, I have sought the best methods which seemed safe, leaving research and experimentation to institutions.

The French, during this same period, had been experimenting with colloidal metals, and have reported results with selenium.

After the investigation of Neuberg and Caspari, colloidal metals were used in conjunction with choline, and they showed, in animals, that the combination of choline with the colloidal metal hastened the disappearance of a tumor.

Combination methods, then, are' surgery, chemotherapy, as represented by borocholine, with or without selenium in the colloidal state, and ray therapy, either in the form of the x-ray, radium or mesothorium, together with the intravenous injections of thorium X.

The physics of radium in this community have become known through the work of Professor Duane of Harvard, and its curative properties through the work of Dr. Francis H. Williams, and later through the work of the Huntington Cancer Hospital.

Experiments of Prime, reported in the *Journal of Cancer Research*, April, 1917, show first, the great difference in the quantities of radium required to kill a physically functionating cell, as the heart muscle, and the normal growing cell such as found in the cell tissues or malignant tumors.

It is probable that the nucleus of the physically functionating cell is as much damaged as that of the inactive type, but as such cells expel the metabolic surplus in mechanical movements, and not in increasing in size and in dividing, as do the connecting tissue and cancer cells, the effect of the radium is not evident.

The second fact brought out in these experiments is that there is little or no difference in the radiations required to cause death of the cancer cell and the normal cell of similar histogenesis.

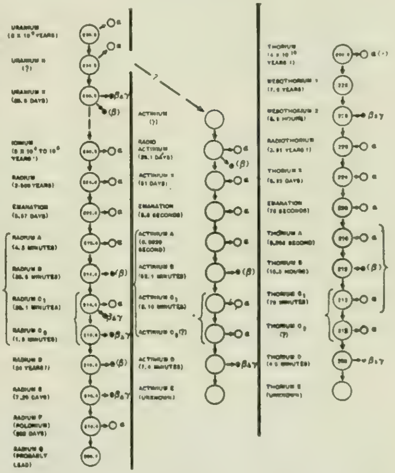
The conclusions are that radium does not kill the cells outright, as is shown by the persistence of beating in heart muscles, with injuries in nucleus in such manner as to prevent further division, which must result in the death of the cell, if its energy is expended in growth and division, and not in a purely mechanical function.

A well-known high resistance to radium to the cells of the central nervous system, which do not divide in adult life, is presumably correlated with the survival of the heart muscle cells after lethal exposures.

Mesothorium, with which I have had considerable experience, is the radioactive substance about which your chairman has suggested that I say something.

It is not my purpose to enter into an extensive discussion of the physics of radioactive substances, of which radium and mesothorium are the most important examples. It would be well to say, in passing, that there is a relation between all radioactive substances based upon their disintegration time.

The two mother ores from which these substances of proven therapeutic value from the standpoint of ray therapy are obtained, are the uranium and thorium groups, both of which have wide distribution. (Refer to the diagram indicating their relationship.)



In obtaining thorium oxide and its disintegration into mesothorium one and two, it is impossible to have a pure chemical salt. All thorium salts are contaminated with some radium content, and mesothorium itself contains rays of value as a 25% radium content, which remains constant, but the mesothorium continues disintegrating into radiothorium.

In considering the disintegration of these substances, we are apt to think of the disintegration periods as having a fixed line of demarkation, but there is no such line, and the disintegration is constant and continuous, and the time of the disintegration becomes more rapid as you go down the disintegration scale. The concentrated ray value is obtained by the use of mesothorium, and the rays are as in radium: alpha, beta and gamma.

"Mesothorium corresponds to radium in that it can be concentrated, and just as radium when first prepared gives out only the relative unimportant A activity proper to itself, develops, in time, enormous activity, due to the growth and accumulation of its products."

What actually happens is a steady growth and increase in A, B and Y activity of mesothorium for many years after its preparation, due to the growth of radiothorium and its products, and this change is also complicated by the fact that radium is invariably present in mesothorium preparations, and comes from the fact that monazite sand, from which thorium is prepared, always contains a minute amount of uranium, and therefore the corresponding amount of radium on concentration and extraction.

As there is no dearth of the raw material from which thorium can be prepared, it has been stated by Soddy that a single year's production would suffice to produce a preparation having many times the activity of all the radium ever extracted in the whole world, and by reason of the fact that it can be produced as a by-product in the production of thorium oxide, the cost of it should decrease once the demand for it is supplied.

If the theory of the x-ray men who have had most experience is correct, that the beginning of the curative process brought about by ray action is the decomposition of the lecithin of the nucleo proteids of the malignant cell into basic choline and fatty acids, then we should carefully consider pre-operative treatment in cases which we still consider in the operable class.

It is, of course, open to something of the same objection as operative procedure alone.

All neoplasms consist of two main elements,—the cells and the stroma.

The criterion of malignancy is the breaking through of the basal membrane by the epithelial cells. Those who are concerned with the methods of invasion and with the pathological classifications will do well to consult Walker's translation of Unna's Histopathology of Diseases of the Skin, New York, 1896; Bloodgood, *Progressive Medicine*, December, 1904; Adami, Principles of Pathology, New York, 1908; Hertzlei, Treatise on Tumors, New York, 1912.

TREATMENT OF CASES.

As treatment is still in the stage of evolution, certain illustrative cases will be discussed.

All pre-cancerous conditions or localized cancerous processes should be treated upon the clinical diagnosis. It is evident from the results following operations where there is recurrence, and it is apparent in many cases in which medical operations are done that the breaking down of nature's resistant barrier to the malignant process opens up lymph spaces and causes the growth apparently to change its character and develops a resistance to ray therapy which the original growth did not have.

There appears to be an essential change, perhaps due to the new soil into which the growth has an opportunity to extend.

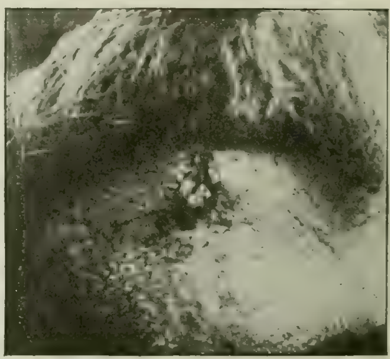


PLATE 4.

Plate 4 shows a man of 78, referred to me by Dr. F. J. Hanley of Whitman, on whom a V-incision was made for the removal of an epithelioma of the lip, followed by a recurrence in the scar. This recurrence was extremely painful and had marked induration about it. Two applications of 10 mgm., with local application of 10% borocholine, caused a healing. This healing was followed by another breaking down of small amount which did not respond to mesothorium (Plate 5), so it was excised by a small V-incision, local cocaine infilt. anesthesia, without a recurrence. This represents the resistance of the recurrence of epithelioma in the presence of scar tissue, which is extremely resistant to ray therapy, but the combination of ray therapy with surgery will keep it in control.

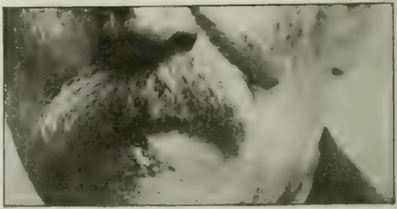


PLATE 5.

The use of ray on a recurrence of malignancy in scar tissue and its non-response to treatment, raises the question of whether scar tissue is more resistant to penetration to ray.

PRE-CANCEROUS DERMATOSES.

It has been pointed out that various keratoses form the commonest cutaneous lesions to take on malignancy (Bowen, *Jour. Cutan Dis.*, 1912, xxix, 241).

Histological studies of pre-cancerous conditions have been made by numerous research workers (Greenough and Hartwell, *Jour. Med. Res.*, xv, 416; MacCarty, *Surg., Gyne. and Obst.*, 1913, xv, 1141).

The factors, however, that lead to malignancy must be numerous and varied. It may be that arteriosclerosis and other anatomical changes of old age may be factors in the development of epithelial malignancy. Warner (*Surg., Gyne. and Obst.*, 1916, p. 413) and Bloodgood (*Progressive Med.*, December, 1903, p. 149) believe that all acquired or congenital moles, that were subject to continuous irrigation, or began to grow, or showed any signs of ulceration, should be removed·

For this type of cases unfiltered mesothorium in small doses and short (thirty minutes to one hour) is the best method of removal. I have found it painless and safe.

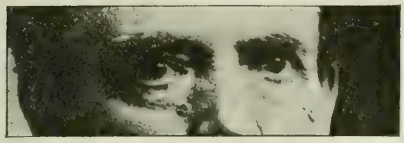


Plate 6.

Plate 6 represents ulcerating keratosis.

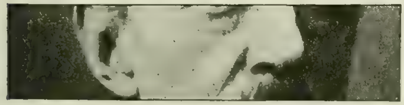


Plate 7.

Plate 7. Cure following two half-hour exposures to 10 mgm. mesothorium.

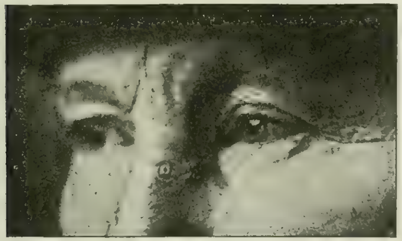


Plate 8.

Plate 8 shows a border-line case. Mrs. C. H. Referred by Dr. Putnam of West Newton. Trouble started sixteen years ago in left side of nose. Was treated with electric needle. Six or seven years ago it broke out, healed and broke out. Treated by various salves. One-hour application 14 mgm. to the ulcerated left inner canthus, one hour to the tip of the nose, 10 mgm. Cured in six weeks. (Plate 9.)

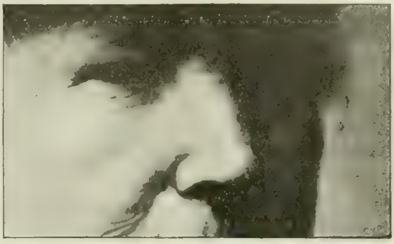


Plate 9.

Mesothorium is not always in its effects destructive; its rays may approach the results of construction.

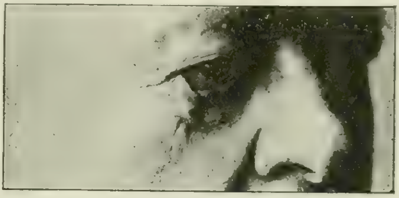


Plate 10.

Plate 10. Case referred by Dr. G. W. Dow of Lawrence. Represents a recurrence of an epithelioma in scar tissue, which resulted from the destruction of the original epithelioma by caustic, and with the recurrence of the epithelioma there was marked puckering of the lower eyelid so that the eye could not be completely closed. One one-hour application of 10 mgm. mesothorium, followed at intervals of a month by two applications of the same amount of substance for one-half hour each, not only destroyed the epithelioma, but it vascularized the scar tissue so that the scar tissue relaxed and the eye could be closed. (Plate 11.)

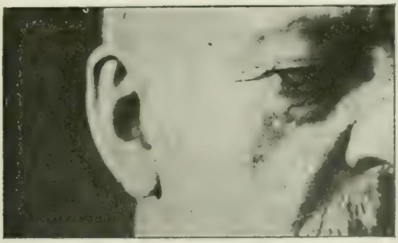


Plate 11.

Comparatively large growths in parts not surgically accessible can be successfully attacked.

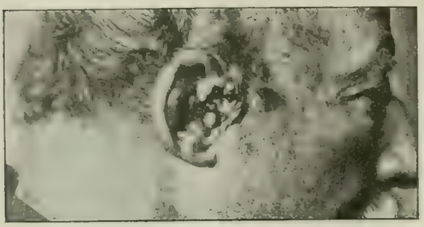


Plate 12.

Plate 12 represents an extensive epithelioma, involving the temporal region and extending into the ear and destroying the anterior part of the canal. First treatment began Jan. 10, 1917, and consisted of 40 mgm., one-hour application, followed by beginning healing. Subsequent dosage at one-month intervals for 40-minute applications of 20, 10 and 10 mgm., has brought about condition shown in Plate 13 of practical cure. Needs perhaps one more application.

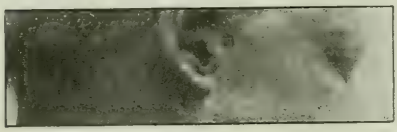


Plate 13.

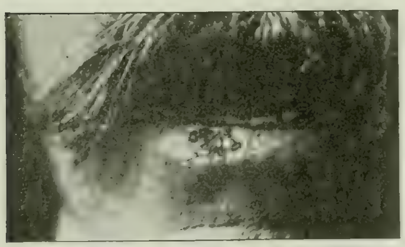


Plate 14.

Plate 14. Mr. P., 52, married. March 2, 1916. Represents a very painful and markedly indurated lip with epithelioma. In this case the submental gland was palpable. This lip was so painful that the man could take only liquids, and the induration was so marked that it would not have seemed to me a favorable case when we depended upon surgery alone. Thirty-three milligrams of mesothorium for one hour caused, within 48 hours, a cessation of pain and a continued healing. Three other applications of 10 mgm. were given as the growth diminished in size, and at the end of nine weeks it was completely healed and has remained healed. (Plate 15.)

As the healing process went on, the submental gland became smaller, and a month after the healing process could not be palpated.

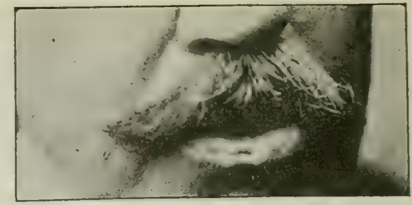


Plate 15.

In the autolysis of the cancer cells necessary to the healing of the lip, is there produced the substance which has an influence upon the isolated cancer cells which may have been carried in the lymph stream?

Is the shrinking of the gland, which follows the disappearance of the cancer, due to the elimination of the cancer alone?

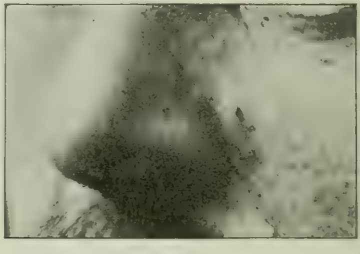


Plate 16.

Plate 16. E. L. C., railroad worker, 48, single. Feb. 25, 1913. Represents a recurrence of an epithelioma in a scar. This was resistant to liquid oxygen ray therapy, a portion of it healing, and then the entire scar tissue was excised under local anesthesia, with a complete healing and no recurrence after four years. (Plate 17.)

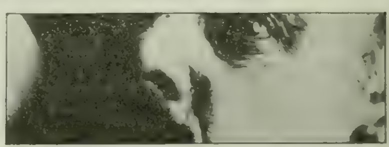


Plate 17.

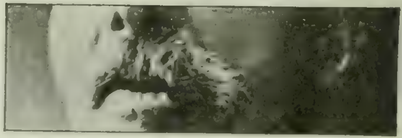


Plate 18.

Plate 18. Patient, aged 64, referred by Dr. M. W. White of Somerville. Wife had extensive carcinoma of breast and mediastinum. Epithelioma at this age responds well to mesothorium. Cure obtained (Plate 19) in eight weeks, by relatively light dosage.

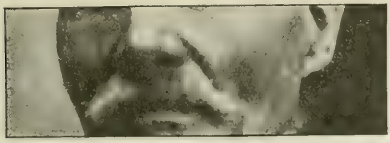


Plate 19.

Malignant disease of the tongue and mucous membrane of oral cavity, seen late, does badly as a rule under all forms of treatment. Taken early, satisfactory results are sometimes possible.

Mr. M., referred to me by Dr. F. E. Withee of Newton Highlands on Sept. 3, 1916. He showed an ulcerative papilloma inside the right cheek about one-half inch in diameter, and extending down from ulcerative process and onto gum was a distinct leucoplakia. Enlarged glands not discernible to palpation. Wassermann negative. Two applications of 14 mgm. mesothorium for one hour each caused a disappearance of the papillomatous growth. The leucoplakia was more resistant, and after 15 half-hour applications of 10 mgm. mesothorium there was a small spot on the gum margin at base of right second lower molar on March 10, 1917.

METHODS OF INJECTION OF BOROCHOLINE.

There is the subcutaneous method which I have discarded because of the danger of the production of sloughs.

The second method is the intramuscular method of concentrated solutions of borocholine. Five per cent. solutions are best borne, and after a time, 10% solutions are borne. These injections are made deep into the muscles about the shoulder girdles, and in the gluteal regions, until 3 grams of basic choline is given.

Colloidal selenium vanadium is also given in the same manner, sometimes with the choline. I now give 2 cc. of selenium (Laboratory Clin. preparation) to 8 cc. 5% solution of borocholine.

Intravenously there is a considerable reaction, and it is given in a similar manner to salvarsan at the most accessible vein at the bend of the elbow, and is given in the proportion of 10 cc. of 10% choline to 50 cc. normal salt solution.

Combination of choline, ray therapy, operation, ray therapy:

Mr. A., age 56, came to me on April 10, 1914, with a tumor in lower part of left breast, which he had noticed for six months. The skin was not puckered, but the growth was not freely movable. From April 10 to May 24 he was given 12 intramuscular injections of 10 cc. of 5% borocholine with 1 cc. of electro selenium vanadium (Laboratory Clin.). The tumor shrunk and became harder and movable.

Operation May 31. Tumor removed, and proved to be a spindle-celled sarcoma. Following operation, 50 mgm. mesothorium with 1 mm. filter of lead and surrounded by rubber tissue, was left in wound for 12 hours. Wound then closed.

Returned on June 16 and 25 for treatment.

On Feb. 18, 1915, recurrences appeared in scar. Again, 6 choline injections. Excision of scar. Ray therapy as before.

No recurrence to date.

In cases of doubtful diagnosis it is well to try out these methods before extensive mutilating operation is advised.

Mr. H. G., 48 years old and married. Referred to me by Dr. Hollingsworth of Providence, on March 22, 1914. Gives a history that January, 1914, was troubled with his tongue. He was a jeweler and worked where there was a great deal of acid. Tongue scraped on his teeth. Consulted Dr. Arthur Hollingsworth. Operation was done the last of February. Small nodule on left side of tongue was removed. Under microscope appeared to be a round-celled sarcoma. In two weeks had recurred twice the size of a pinhead. Second operation March 13; the size of a pea. No enlarged glands. Works in nitric acid fumes and also used a lot of blue vitriol. Was given injections of 10 cc. selenium vanadium for a week, followed by a solution in two weeks and one application of mesothorium—14 mgm. mesothorium one hour, by stirrup method. Complete disappearance of growth.

Later the slides were referred to Dr. F. B. Mallory of the City Hospital, who made a diagnosis of hemangioma.

Where there is a malignancy of the pleura or of the lung, with or without the accumulation of ascitic fluid in the chest, the relief of the dyspnea, which is the most constant symptom, may be obtained by the injections of choline alone or by the use of thorium X solution. By the mouth, 25,000 units a day may be given with marked relief of dyspnea. This has been repeatedly shown in my cases. It may also be given intravenously.

Mrs. F. W. Following operation for breast, there was mediastinal recurrence. Seen in consultation with Dr. Garland. There was also some swelling of the arm. In this case the chief complaint was dyspnea. After a few intramuscular injections of choline in the muscles of the back, thorium X was used in 25,000 unit strength daily, and her symptoms were relieved within the first week, and did not recur until shortly before her death.

In inoperable and recurrent cancers, radium, with or without chemotherapy, is substantially the only therapeutic agent that we have, and in the inoperable cases, when we give them comfort we are doing a great deal.

I have used various methods in bringing relief to hopeless, recurrent cases, the most painful type represented by the pressure either upon the nerve trunks in the neck or in the nerve trunks of the pelvis. With the pressure of the nerve trunks in the neck there may be a tremendous swelling in the arm on the affected side, and in addition to the actual pressure in the neck is the discomfort from a hand and arm, and the fingers cannot be bent or the joints moved on account of the swelling.

This seemingly hopeless case responded surprisingly well:

F. W. S., 43 years old. Patient of Dr. George W. Ryan. Wife died of carcinoma of the liver in 1911. June 15, 1913, first noticed trouble. Complained of trouble in stomach and abdomen. Was seen by Dr. Broderick, Jamaica Plain. Advised operation. Operated on by Dr. F. B. Lund, Boston City Hospital. Dr. Lund made an exploratory operation and made a diagnosis of carcinoma of the liver. He returned from the hospital October 1, 1913. Diagnosis, carcinoma of the liver. October 15, 1913, was treated by Dr. Howard Kelly of Baltimore with a five-hour application of 600 milligrams of radium filtered. Remained in the hospital two weeks and then returned home. He was told by Dr. Kelly to return in six weeks for treatment, but was too much used up to go back. January 7, 1914, patient developed jaundice. This time he was unable to be up and about. No specific disease and the Wassermann was negative.

Entered the hospital under my care on January 8, 1914. The liver at that time was three inches below a line from the umbilicus to the anterior superior spine. Beginning Jan. 9, 14 doses every other day of choline and selenium vanadium, one part selenium, 9 of a 10% solution of borocholine; 2 intravenous injections of thorium X.

Jan. 28 to Feb. 4 was given cholalin, half a grain, three times a day on account of clay-colored stool.

Feb. 4 to Feb. 18, eight injections, 10 cc. of choline selenium diluted with 20 cc. of ascitic fluid and six injections of 30 cc. of 10% choline selenium, intravenous thorium X; 500,000 units Feb. 4.

Following Feb. 18 he had two weeks' rest at home. He developed an ischio-rectal abscess, which was opened May 1 under cocain. Received the combined treatment regularly from March 1. Was tapped on Feb. 4 and some fluid accumulated and was drawn. Twelve injections were given up to Feb. 9, 1914. July 10, 1914, case was able to do ordinary work and wanted to go back; was in very good condition and went back to some work. He left this part of the country and went West, where he died some time in 1916.

The work of Hodenpyl in treating cancer of the liver with ascitic fluid takes on new interest in connection with this case.

In addition to those that are inoperable, there is another large group of cases in which amelioration may be obtained by combination therapy, in persons suffering with a complication of malignancy of heart disease, nephritis, or marked arterial changes, or the result even of apoplexy. We certainly are justified in extending to this type the amelioration that comes from ray therapy, and in all cases where operation is contraindicated we still have recourse to ray therapy. There has been a marked advance in x-ray therapy since the advent of the Coolidge tube, with perhaps the use of larger currents and the development of larger quantities of rays in a shorter period of time.

In actual treatment, mesothorium is found to be more active superficially; somewhat less active through a great thickness of tissue.

For prophylactic treatment, roentgen rays are preferable to radium because larger surfaces can be uniformly rayed. If a deep-seated tumor cannot be made accessible, here again x-ray is preferable.

CONCLUSIONS.

All superficial ulcerations and all pre-cancerous conditions yield readily to local ray therapy. Moderate doses should be used at the beginning, not exceeding 30 mgm. hours at one dose. If there is no response, choline injections are injected intramuscularly as a preliminary to a second dosage. Large ray doses are indicated for deep cancers, which should be made accessible to the surface, so that there is a certain application of the rays to the malignant cells, and when large doses are used there should be means provided for the draining of decomposition products.

A desirable thing is to cause a disappearance of the cancer cells rapid enough to overcome its growth, and slowly enough that too much cancer toxin is not set free into the system.

In all cases of carcinoma of the breast, the follow-up treatment by chemotherapy and ray therapy, as represented by the x-ray, is desirable.

I am convinced, however, that there should be some properly correlated method of treatment, under some device so that when a surgeon has done what he thinks best, and recurrence, which occurs in the greater majority of cases, takes place, there should be some method known so that these poor unfortunates are not exploited by charlatans, and drift despairingly from one person to another because there is no authoritative voice to indicate a rational course for them to pursue.

Very few physicians in private practice can afford to purchase or maintain the armamentarium necessary for large ray dosage, and even if the radioactive substances are given freely, it is impossible to maintain the patients under these conditions so as to secure the best results.

There is not enough radioactivity in the world to treat properly malignancy by the massive dose method alone.

The substances necessary for massive doses must be so handled that all the twenty-four activity may be utilized, and that the tremendous loss that exists through wide distribution and limited ray use may be obviated.

Massive doses should be reserved for large growths, where it is possible to have complete drainage. Growths on epithelial surfaces, especially where there is free lymphatic anastomosis, should be treated by chemotherapy, ray and excision, without extensive dissection.

Where there are metastases, no treatment is other than palliative. Marked cachexia is also a contraindication to operation.

DISCUSSION.

Dr. Edward Reynolds, Boston: I have listened with especial interest to the communications of Dr. Greenough and Dr. Donoghue, because both of them have been so judicious in the limitation of their statements, in marked contrast to many of the reports which are presented by radiologists.

The results of the last five years of treatment by various forms of radiation have certainly failed to justify the hopes of cure of cancer by radiation, which were at one time entertained, with the single exception of the limited field referred to by both the speakers, and so well illustrated by Dr. Donoghue's photographs,—the malignant and semi-malignant diseases of the skin, in the early stages of which radiation is certainly effective. Both speakers have emphasized the fact that this does not imply the use of radium as a curative agent to cancer in other localities.

The experience of recent years is, however, steadily more encouraging on the use of radiation as a palliative in the treatment of advanced and incurable cases.

My own special field today is to speak on what may be called the preventive or prophylactic surgery of cancer, on the treatment of early cases,—a field the hopefulness of which is in marked contrast to the use of the radical operations for established cancer, or of radium for the advanced and incurable cases.

Cancer has long been looked upon by the laity as a hopeless and incurable disease. Even the medical profession knows only too well that under our former conceptions of it, its prognosis was anything but good, even after the most radical treatment. Our exact scientific knowledge of its nature is still far from complete, but from a practical standpoint we now know that most cases go through what is often termed a pre-cancerous stage, in which the disease is essentially curable.

The importance of disseminating this view, not only to the widest possible degree throughout the profession, but also among the laity, led to the formation about five years ago of the American Society for the Control of Cancer, which has since been conducting a widespread campaign of education, both among the laity, and by the coöperation of the state and national medical societies, throughout the profession. Much good has already been accomplished, and much remains to be done. We may be proud of the fact that the Massachusetts Medical Society is now among the most active of the several state societies in this campaign, and this present discussion is one of the evidences of it.

Our present conception of the natural history of cancer is in sharp contrast to that which most of us were taught in our student days. We know now that most cancers occur at a spot which has been subjected to continuous irritation, either mechanical or physiological; that the first sign of their presence is usually a proliferative activity of the epithelial cells at this spot, which is always strictly localized and usually, for a greater or less time, non-malignant. This condition constitutes the so-called pre-cancerous stage. Our present conception of our first duty as diagnosticians is to attempt to diagnose these conditions while they are still non-malignant, and capable of relief by minor methods, thus avoiding the radical and disfiguring operations.

We know, too, that even after the appearance of malignant cells there is a stage, which is brief in some localities and fairly long-continued in others, during which the malignancy is strictly localized, and is still susceptible of radical removal and cure. Our second objective is to diagnose the disease, at least, in this stage, even in the less accessible localities. An extensive and radical operation, if performed then, yields almost a certainty against recurrence, while we all know that such operations performed only a little later give but a too small percentage of permanent immunity.

The classical diagnostic signs of malignant disease, which we were all taught, are now known to be distinctively the signs of its incurable stages, and for the most part, of its incurable stages only. The physician who waits for them throws away his patient's chances and neglects his duty in our present state of knowledge. The curable stages of cancer cause no pain. The symptoms vary with the situation. They are never distinctive, but are usually sufficient to warrant suspicion, which should then be immediately confirmed or dispelled by the most thorough possible physical examination and, in case of doubt, by operation. To wait for an assured diagnosis from symptomatology means losing the prospect of cure.

We now draw no sharp line between benign and malignant growths. Many benign growths eventually become malignant, and such growths should, therefore, be removed without delay. In most cases this can be done by really trifling operations.

The symptoms which should arouse suspicion vary with the locality in the body at which the growths occur, and it is impossible in a brief time to speak of all of them, but the great majority of all cancers occur within the limits of a few situations, and these more frequent classes can be summed up in a few minutes.

The Breast. This is a situation in which a very large proportion of all chronic lumps become malignant, and it is, moreover, a situation in which malignancy often occurs early and always generalizes with great rapidity. The acute lumps which occur in the nursing breast usually clear up completely, and if they do so are unimportant. Such breasts should always, however, be examined later for possible persistence of the lump. All other lumps in the breast should be regarded as suspicious,—they should always be removed without delay, and while it can be done by a non-mutilating local operation of trifling grade.

It is always important that a new growth should be examined microscopically while the operation is still in progress, so that if malignant tissue is found, an extensive and radical operation can be done at the same sitting; radical operations performed even a few days after the removal of a suspicious growth are far less successful than those which are done at the time. This is especially important in the breast; in this situation, in particular, a radical operation done even a week or ten days after an exploration is very rarely successful in affording permanent immunity. Never cut into even an apparently benign growth. Cut around it in clear tissue. Malignant cells may be present in any such case, and an incision into malignant tissue makes a local recurrence probable.

Cancer of the Uterus. Cancer of the cervix uteri becomes generalized very early, and is, therefore, one of the most fatal of all cancers. This is, on the other hand, one of the localities in which the prevention of cancer is easiest. Cancer here is almost invariably preceded by erosion, usually in a somewhat large and hard cervix. The symptoms of erosion are the appearance of an irritating leucorrhea; every such discharge should be regarded as suspicious, and lead to prompt physical examination. When all such cervices are treated by prompt repair (usually best by a V-shaped amputation) cancer of the cervix will hardly be seen. A later symptom is the appearance of slight, irregular bleeding. Slight stainings after mechanical contact with the cervix are especially significant.

When an eroded cervix begins to bleed, its amputation is imperative and must usually be extensive. Such specimens should be examined at the time of operation, and a radical operation performed at the same sitting if malignant tissue is found.

Cancer of the uterine body is less common, less rapid, less unfavorable. Its first symptom is irregular flowing, most often slight and serous in character. Any recurrence of flowing after the menopause is especially significant. On examination, the uterus is found moderately enlarged. These symptoms may mean only a benign hypertrophy, but they are equally characteristic of adenoma, adenocarcinoma, and even of early true cancer. After an early hysterectomy the prognosis of even a true carcinoma of the corpus uteri is very good. A positive diagnosis can be made only by the microscope after a curettage, which should be very thorough, as in early cases the disease is often limited to one spot. Hysterectomy should be done at the same sitting if malignant tissue is found.

Cancer of the Digestive Organs. While these are among the most common situations for cancer, they are, unfortunately, among the most unfavorable from their inaccessibility and the difficulty of making positive early diagnoses. It should be especially noted that it is very rarely possible to detect a mass before the cancer is incurable.

Every case of chronic indigestion which resists ordinary treatment should be considered suspicious and subjected to the most thorough physical examination, including the bismuth x-ray and analysis of the secretions. Vomiting of blood or the appearance of blood from the anus are later, rather than early symptoms. Every such case demands the most thorough examination, and unless an evident cause for the loss of blood is found, an exploratory abdominal incision is warranted.

Cancer of the Skin. Here the disease for the most part originates in or about warts, moles or birthmarks. They ordinarily assume malignancy slowly, and from their accessibility and visibility should always be diagnosed early. Any wart, mole or birthmark which becomes irritated, enlarges or undergoes change of color should be promptly removed by whatever method will make the least scar. Superficial proliferations of the skin are often best removed by freezing mixtures; small, deeper ones by the knife or scissors,—escharotics should not be used.

The American Society for the Control of Cancer is now actively at work in the preparation of a pamphlet designed for circulation among physicians, in which the latest views on the nature and treatment of cancer in its many forms will be given in detail. All that will be said in it may be regarded as highly authoritative, since in addition to its having been prepared by a committee of eminent surgeons and pathologists, its entire substance will have been read and assented to throughout by the National Council of the Society, which is composed of prominent members of the profession from all over the country. The standing committee on cancer of the Massachusetts Medical Society anticipates that copies of this pamphlet will be distributed by the Massachusetts Medical Society to physicians throughout the state. We hope that this pamphlet will be read and preserved for reference.

DR. THOMAS ORDWAY, Albany, N. Y.: As a result of the papers and the discussions this afternoon, I am tempted to speak of a great many things, but because of the lateness of the hour and the closeness and heat of this room, which I know is fully as intolerable to you as it is to the speaker, I will limit my remarks to a few suggestions and conclusions.

I might discuss the question of psychic treatment, which plays a great part in cases of inoperable cancer, and particularly in the so-called combined methods. I might also speak of the possibilities of using radioactive substances in private practice, for that certainly is a possibility. I might refer to the work of Ehrlich and Wassermann and others; but I will refer particularly to the variability in the life history of cancer, which accounts, I believe, for many of the alleged cures. Many surgeons and physicians, not having intimate association with cancer from the beginning to the end, in a large number of cases do not realize the great variability in the natural history of cancer, a variability from two years or three years, to seven, nine, thirteen, and in one instance I remember of a case which was histologically cancer apparently existing for twenty-five years. I might also refer to the question of heredity in cancer, and to cancer in animals as compared with cancer in humans. I will, however, limit myself to a few statements, and wish to emphasize, at the outset, that I agree absolutely and completely with the conclusions reported by Dr. Greenough.

Marked changes may occur on the fingers of those engaged in routine work with radioactive substances. These local objective changes consist chiefly of flattening of the characteristic ridges, thickening and scaling of the superficial layers of the skin, and even atrophy and intractable ulceration. These lesions are usually slight compared with the marked subjective symptoms, such as paresthesia, anesthesia of varying degree, tenderness, throbbing, and even pain. The persistence of such effects is noteworthy.

Various general systemic symptoms and also blood changes may be produced by exposure to radioactive substances. To avoid such local and general disturbance, special protective and preventive measures have been devised, and those engaged in routine handling of radioactive substances are particularly cautioned.

Surface applications of radium in leukemia produce striking, indeed remarkable, improvement in the blood picture, which becomes almost normal; in the size of the spleen and glands, which are reduced almost to normal; in the general condition of the patient who, from an emaciated and weak condition, may become plump and strong. The duration of remission is variable; it may last from months to years. The results of radium treatment are *not* regarded as curative. It is believed to be, however, the safest, as well as the most prompt palliative measure in cases of chronic leukemia.

whether *refractory* or not to benzol or x-ray treatment. From the results of radium therapy in leukemia, it is believed to be the best form of treatment now at our disposal.

Toxemia. May be avoided by proper diet, dosage, and clinical observation.

The best, apparently curative, results from radium therapy are obtained in certain types of skin cancer and other localized forms of cancer. In many cases of true cancer which have advanced beyond the operable stage, or those recurring after operation, improvement from radium therapy may follow, not only subjectively, but in the local condition. This improvement may include relief from discharge, hemorrhage and pain, cleansing or healing of ulceration, diminution in size or disappearance of the growth. Such cases, however, are rarely cured. Even large growths sometimes disappear under the influence of radium, but meastasis or spreading of the growth to other parts, is not prevented, or the patient may succumb to the rapid disintegration of the original growth.

Exceptional Cases. As the lawyer in cross examining a medical witness, is apt to cite an exceptional case as the rule, so this is frequent in those reporting results of radiotherapy, and tends to place the latter in disrepute, but it would seem that intensive study of these very unusual and exceptional cases might enable us at least to add to such cases.

Newer methods may improve these results of radium therapy; at present its proved value is limited, but occasionally cases beyond these well-recognized limits are distinctly benefited.

From the various and often conflicting reports as to the question of dosage in radium work, and from personal observation, it does not seem that any definite system or fixed basis of dosage can be given. There are, evidently, limits beyond which it is not safe to go, and below which little good can be expected. The main object is the results, as measured by the improvement not only of the local, but the general condition of the patient. The dosage and all other factors must be managed best to secure this.

It is of the utmost importance in reporting cases treated, that accurate data should be given concerning the general condition of the patient, as well as the local findings, and that the end-results of all cases should be demanded, if necessary, by secondary reports. Reports of cases without such observations, and without subsequent reference to the final results, are misleading, and have been productive of much disappointment to both the physician and patient.

THE ROENTGEN DIAGNOSIS OF THE PATHOLOGICAL GALL-BLADDER.

BY A. W. GEORGE, M.D., BOSTON,
AND
R. D. LEONARD, M.D., BOSTON.

THE ability to detect gall-bladder disease by means of the Roentgen ray has made favorable progress during the past two years. In this line of work, however, the European roentgenologists have given us but little help. The war of course has temporarily paralyzed all foreign scientific work except that of distinctly military value. Furthermore, the European fluoroscopic method of abdominal examination is not suitable for gall-bladder work. Only by the use of serial plates can the gall-bladder and its contents be visualized.

Even in this country until recently the only direct Roentgen evidence of gall-bladder disease was the demonstration of gall-stones. Roentgenologists have competed with one another as to which one could show the greatest percentage of stones. These percentages have varied all the way from 20 to 100 per cent.

Most of us soon realized the uselessness of this sort of work, first because of the incompleteness of our data on which to base figures, and second, we realized that the mere presence of gall-stones was not necessarily an etiological factor in the patient's symptoms. Many apparently normal persons have gall-stones. So we have endeavoured to find further diagnostic evidence of gall-bladder disease.

This evidence is of two types, the indirect, where the effect of gall-bladder disease is demonstrated on other organs; and the direct, where the gall-bladder itself is visualized on the Roentgen plate. This demonstration of the actual gall-bladder is the important factor in the Roentgen diagnosis of gall-bladder disease.

From our experience in the study of hundreds of right upper quadrants, we are convinced that with our present technic, the *normal* gall-bladder cannot be demonstrated on the x-ray plate. And that only when some abnormal change takes place, such as a thickening of its wall, increase in size, presence of tarry bile or stones, or, in brief, some alteration of its normal density, only then will the outline be visualized on the plate.

The converse of this proposition is our working hypothesis, namely, if the gall-bladder shadow is seen on the Roentgen plate, that gall-bladder is pathological. In the future this theory may be proven unsound, but with our present technic the practical results justify its use.

As a corollary to this proposition a problem frequently arises. The report is made to a surgeon that his patient shows x-ray evidence of a diseased gall-bladder., The surgeon operates, and tells us that our intrepretation is wrong, that he looked and felt of the gall-bladder and it was normal. Now we feel that no one has any right to say that a gall-bladder is free from disease unless it is opened and its lining inspected and the character of the bile observed—better still, the removal of a piece for microscopic examination. I believe that the x-ray will reveal pathological changes in this organ or its contents which cannot be detected by mere external inspection or palpation. This question perhaps will be taken up more fully in the discussion.

There is no special technic. Intensifying screens must always be used. The patient must be taught to hold his breath. The tube must be of sufficient hardness just to penetrate the patient.

DISCUSSION.

DR. GEORGE CARROLL SMITH, Boston: According to Dr. Leonard's paper, the presence of gall-stones in the gall-bladder does not of necessity make a pathological gall-bladder in the roentgenological sense, hence this may explain the fact that an indefinite number of such cases cannot be shown by x-ray. This view is quite consistent with the statement of many writers in clinical medicine.

There are two theories as to the origin of gall-stones. The followers of Naunyn believe that cholesterin—the main constituent of gall-stones—is neither a metabolic product nor a secretion of the inflamed or infected mucous membranes of the bile ducts and gall-bladder, and the lime salts,—the other chief substance composing the gall-stones,—originate in the same way, that is, without primary change in the mucosa and its infection. Cholesterin and bile salts are not aggregated into gall-stones. More recently, followers of Aschoff and Backmeister believe "that cholesterin is precipitated from bile itself, and that inflammatory change of the mucosa of the gall-bladder is unnecessary to form gall-stones, but obstruction of the outflow of bile is sufficient; furthermore, it may be precipitated in aseptic conditions and without inflammatory change." Concentration of cholesterin and a reduction in solubility and resorption, may and unquestionably do, form pure cholesterin stones in this way. Most authorities, however, agree that fixed gall-stones depend upon infection. Associated with infection, there is: (1) stasis of bile, (2) precipitation of cholesterin, (3) cleavage of albumin content, and (4) epithelial degeneration.

Elsner says that 10% of all autopsied bodies show gall-stones, and of this number 95% never had symptoms which suggested their presence. If, then, the roentgenologist, with increasing experience, is ever able to show all such, he will render much greater service to the clinician than by showing the presence of stones which we already know are there by their marked clinical symptoms. Permit me to say in closing, that I have grave doubt about the large per cent. of gall-stone cases quoted as presenting no symptoms. They are probably accompanied by such slight symptoms of backache, dyspepsia, bilious headaches, that the patients are too often left to make their own diagnosis. More careful study of the slight, indefinite and vague symptoms, in many cases, would lead to a correct diagnosis of gall-stones. Often, our greatest difficulty is reached when the question comes up what to do with the cases of so-called gall-stones without symptoms. Of course, each case should be decided upon, *only* after careful study; as a rule, the very young and those over sixty years of age should not be operated, while the others should be carefully watched with a view to operative procedure.

DR. CHARLES C. CARROLL, Dorchester: The diagnosis of pathological gall-bladder is at times extremely difficult. Nearly every surgeon will admit that, after bringing to bear all his knowledge of theory, operative experience, and painstaking effort at differential diagnosis upon what seems to be a lesion of the upper abdomen, and then, after surgical interference and careful inspection of the structures that could give rise to the clinical symptoms, including a gall-bladder that seemed innocent, one that was normal in size, shiny, robin's egg blue, not thickened, no adhesions and compressible, he may continue the search in the lower abdomen and find an abnormal appendix, generally of the retroceca lype, remove it as the sole disturber, and close the abdomen with the operative diagnosis of chronic appendix. After an interval, the patient is perhaps no better so far as the upper abdominal symptoms are concerned, and then the surgeon realizes that he has been mistaken in his interpretation of the case. Subsequently, operative interference is again resorted to, the gall-bladder removed or drained, and the symptoms vanish and the patient regains his health.

Gibson of Philadelphia, a few years ago read a paper on gall-bladder disease before this Society, in which he recounted his experiences, and cited a number of cases to bring out his failures in this field, maintaining that an innocent-appearing gall-bladder may be pathological and harbor an infection that can be vicious in its manifestations.

It is generally admitted that lesions in the upper abdomen are frequently atypical and difficult to interpret, and that appendicular disease at times closely simulates upper abdominal symptoms; in fact, in my experience, it is the rule to find a chronic, generally retrocecal, appendix with the pathological gall-bladder.

Braasch, in a recent consideration of two hundred and fifty-one cases of nephrolithiasis, found that in 12% pain due to the lesion was referred to the region of the gall-bladder. Cholecystitis and duodenal ulcer frequently cause adhesions between neighboring organs, such as duodenum, gall-bladder or colon, thus further complicating the diagnosis.

From what has been said, it is apparent that one's diagnosis of gall-bladder disease is not always secure, and it would seem that any procedure that assists in arriving at a more certain interpretation should be welcome.

I have been familiar with the efforts of Drs. George and Leonard in this field for the past two or three years, and when in doubt have submitted my cases for Roentgen examination. I have had some twenty-five cases in this series; Dr. George reported stones in four, all young women who had not borne children, ages twenty-three to twenty-five; all had chronic appendices and no history of typhoid. Case 1. Mrs. S. Clinical diagnosis, gall-stones and chronic appendix. Roentgen diagnosis, gall-stones and chronic appendix. Operative diagnosis, gall-stones and chronic appendix. Fifty-two white stones were removed at operation; no adhesions; gall-bladder not markedly thickened; gall-bladder drained, not removed, badly kinked retroceceal appendix removed. Case 2. Miss H., 23. Clinical diagnosis: chronic appendix, pelvic tumor, and question of gall-bladder or duodenal ulcer. Roentgen diagnosis: pathological gall-bladder, no duodenal ulcer, chronic appendix. Operative diagnosis: one small stone and very foul gall-bladder, which was not adherent, thickened and of normal color and compressible. Chronic appendix and hematocele of left broad ligament. Gall-bladder not removed because of operative work done in lower abdomen. Case 3. Mrs. J., 25, married, no children, no typhoid. Emergency operation for ruptured tubal pregnancy; exsanguinated at time of operation. No history taken until recovery from first operation, when she was told she probably had gall-stones; allowed to sit up in bed on twelfth day. In the next thirty-six hours she had three typical attacks of hepatic colic. Because of fear of common duct impaction, I had her x-rayed. Report: stones in gall-bladder extending into cystic duct. Operation following day revealed a stone two inches long, an inch and a half wide, and about an inch and a quarter thick, filling the fundus of gall-bladder. Cystic and common ducts filled with scale-like débris and encrusted on duct walls; gall-bladder drained; not removed because of fear of recurrence from scale.

The remaining cases in my series were reported back as pathological gall-bladders. The greater number of these at the time of operation presented gross evidence of pathological conditions. There were some exceptions; two are worthy of note: Mr. D., aged 52, operated upon by Dr. John C. Munro ten years ago for carcinoma of lower lip (block dissection); no recurrence; has had indigestion for years. Clinical diagnosis: chronic appendix and gall-stones and some partial obstruction at splenic flexure. Roentgen diagnosis: pathological gall-bladder, chronic appendix and constriction in descending colon. Operative findings: chronic appendix, band formation across first portion of descending colon, gall-bladder normal appearing but glands on common cystic ducts enlarged. Gall-bladder drained; not removed because of condition of patient. Black, viscid bile drained for twenty-four days following the operation.

Conclusions: The number of cases on which my experience is based, while not very numerous, is sufficient to warrant my confidence in the ability of the x-ray to demonstrate pathological gall-bladder. These were selected cases in which the diagnosis was not clear (with the exception of two stone cases), but in which I suspected the gall-bladder of being responsible for most of the epigastric symptoms.

I consider the positive diagnosis of distinct corroborative value, and in doubtful cases shall continue to use it as I have for the past three years, and I believe the time is coming when it will be a routine procedure in suspected gall-bladder disease.

Book Reviews.

Organism and Environment as Illustrated by the Physiology of Breathing. By John S. Haldane, M.D., LL.D., F.R.S. Yale University Press. 1917.

The small volume introduced by this rather mystifying title is a popular forerunner of the Silliman Lectures delivered this fall at New Haven, and to be published in full technical detail later on.

There is no doubt that these two books will attract the wide and well-deserved attention which must be given to any writings by Professor Haldane on respiration. The activities of his laboratory upon this subject have been responsible for most of the modern knowledge of respiration and have actuated nearly all the modern work that has been done. It is certain to be a pleasure to many who have been unable to read the original investigations, which provide the data for the book in hand, to go carefully through the first three lectures.

In the first of these there is a careful account of the elementary facts relating to breathing, all of which plays about the question of the exact regulation of the CO_2 tension of the alveolar air. This leads necessarily into a discussion of the blood gases, the evidence that CO_2 acts physiologically as an acid, the significance of the excretion of this acid in maintaining the slight constant alkalinity of the blood, the dependence of the organism upon carbonic acid to obtain oxygen, and the dependence upon oxygen to get rid of carbonic acid. Every one of these considerations has crept into clinical medicine for proper understanding of acidosis, and the reader will find them within his grasp, however unaccustomed he may be to thinking in terms of physical chemistry.

But the book is not intended to be a monograph upon respiration, though this will undoubtedly become its real function. Through a realization of the enormous number of factors which play through the entire body upon the respiratory mechanism, apparently regulating it, in turn being governed by the very mechanism they regulate and becoming a definite part of it, the reader is to be led to a distrust of the possibility of ever explaining life upon a mechanical basis,—that is, through the aid of only such physical and chemical laws as we now have. Mechanism will not do in biology. "We can reach no other conclusion than that it is the very conceptions of matter and energy, of physical and chemical structure and its changes, that are at fault, and that we are in the presence of phenomena where these conceptions, so successfully applied in our interpretation of the organic world, fail us."

But vitalism in its turn may not be trusted far. For in the physiology of respiration alone, many facts which would have demanded vitalism a few years ago are found now to depend on very simple chemical regulation. In biology, life must be considered as primal, not of necessity antedated by and incident upon certain chemical and physical laws. We are to study life by every aid science possesses, realizing that, in the complex inter-relations which the body presents in such a function as breathing, we are dealing with a set of processes entirely without parallel in the inorganic world. Life may well provide new physical and chemical laws if it is studied from this point of view, yet it is doubtful if we shall ever obtain satisfactory ultimate explanation.

The philosophy demands a distrust of mechanism and a hesitating sort of vitalism which may, some day, be replaced by a sort of super-mechanism built upon new laws to which life itself will furnish the clues. To those who read critically the author will undoubtedly appear a better physiologist than metaphysician.

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DIRECT MEDICATION.

THE establishment of confidence in the use of drugs in modern medicine is due largely to the separation of the active principle from the crude drug, to the more accurate dosage possible, to animal experimentation and to direct medication by means of the hypodermic needle. The administration of the active principle of the drug obviates the use of the inert matter that goes with the crude drug when administered by the usual route. The many ingredients of the old-time prescription, intended each to affect certain organs, or to combat certain symptoms, brought with themselves the almost impossible task of avoiding chemical and physiological incompatibilities. The present rise in the cost of all materials, in drugs, in solvents, in vehicles, would seem to emphasize the waste of the prescription method of medication. Moreover, the wide possibility for badly compounded, non-palatable, and often substituted drugs, are, though apparently somewhat minor objections, nevertheless, to be considered in choosing the method of administering drugs. For medication in the field, or for emergency medication, where bulk is prohibitive, the direct method of medication is the only possible method. Yet even the administration of active principles, singly as indicated, but by mouth, is not entirely without objection. Dosage by mouth requires larger quantities to allow for loss in transit through the intestinal tract than actually take part in the therapeutic action. Besides, drugs taken by mouth take a long time to manifest themselves, and fail where immediate, drastic action is demanded.

All these disadvantages are overcome by the direct method of medication with the hypodermic needle. Even before the common use of this method of medication, it had been understood that the direct method of medication was the only way to obtain rapid and immediate results. In any event, there can be no use in delaying the therapeutic effect of a drug when indicated. The disadvantages, if they may be thus called, of the direct methods, are that they can be administered only by trained attendants. It is obviously undesirable to have the administration carried out by the patient himself or by his friends. Moreover, the hypodermic needle is a surgical instrument and its use must be accompanied by all surgical aseptic precautions. In the use of narcotics over long periods the adverse psychological effect upon the patient in the matter of predisposing to the habit must be reckoned with.

Of the three methods of direct medication, the endermic, the hypodermic and the intravenous, the endermic is the least satisfactory and the least used. Introduction of drugs into the true skin is irritating, more painful and the rate of absorption is less. The most commonly used method is the hypodermic method, in which the drug is introduced under the skin into the subcutaneous areolar tissue. Introduction into the muscular tissue of drugs causes their absorption even more quickly than under the skin. For very rapid action of such drugs as mercury, camphor, atropine and strychnine, the intramuscular route is extremely useful. Certain muscles seem to absorb more quickly than others: the lumbar muscles, more quickly than the gluteal, and the pectoral more quickly than the lumbar. But the injection of foreign matter into the tissues, even though they are drugs purposed for therapeutic action, has all the disadvantages of the injection of any foreign substance. There is the pain, the irritation and the injury to the tissues which may set up very marked inflammation, especially such drugs as mercury, arsenic, etc. Often deep abscesses and extensive necrotic areas may result. Proper technique, of course, minimizes these accidents. Repeated injections in individuals whose vitality is already much lowered, are additional violences to the tissues that may result disastrously.

However, the intravenous method of medication is becoming more popular because, while having all the advantages of direct methods of medication, has none of the disadvantages. Therapeutic action by the intravenous route is the most prompt of all. Even very large quantities of drugs may be introduced without the danger of injury to the tissues. In this method, of course, aseptic precaution must be observed, care taken not to injure the vein, air must be excluded to obviate the danger of air emboli, and above all the medicament must be introduced very slowly and deliberately, at the rate of a cubic centimeter in one minute. The use of any of the hypodermic methods provides for the administration of medicines at longer intervals because, so to say, the saturation or physiological limit is sooner reached and lasts very much longer. In disturbed or comatose patients the direct method of medication is practically the only possible method. At any rate, the increasing demand by physicians for drug products capable of direct administration into the circulation points to the direction in which the trend of modern therapeusis is going.

THE SPREAD OF THE HOOKWORM.

Most of us are already familiar with the economic aspects of the widespread hookworm infection in the South. Yet little has been said upon the possibility of the spread of this infection by prospective troops to be drawn from this highly infected locality. Stiles has just called attention to this matter in the Public Health Reports of August 17, 1917. The examination of recruits stationed on a government reservation, showed 63 per cent. infected with hookworm. Undoubtedly, examinations on a large scale would reduce this percentage, especially if statistics were compiled for the whole country. On the other hand, regiments taken wholly from the warm parts of this country might show even a larger percentage. The quartering of troops in various parts of the country for training or for other purposes in which there is any considerable percentage of infection, leaves the door open for country-wide infection with a proportionate increase of the problem already present in some of the Southern States.

Moreover, the nature of trench warfare and the mode of living involved therein, offers excellent means for the transmission of the disease directly and for the pollution of the soil permanently. The scale of infection may be large enough to reduce materially, or even to destroy the value of the military units sent. The epidemic in the building of the St. Gothard's tunnel and the one in the Andersonville stockade are notable examples of the vast proportions that such epidemics may reach. The permanent pollution of the soil in which infected armies may be engaged may create a post-bellum problem that may make reconstruction very difficult.

While the hookworm is the most important and the most common parasitic infection of man, there are others which act in the same way although some of them are less amenable to treatment. On the whole, hookworm infection is easy to cure by the intelligent administration of thymol. Of the other parasitic infections, such as the ascaris lumbricoides, hymenolepsis, strongyloides, etc., the latter mentioned is incurable. In any event the cure of isolated cases is not the aim of the sanitarian, particularly because the damage has already been done to the individual and he is lost to the organization, and the efficiency of the unit is already lowered. The prevention of hookworm is a comparatively easy problem requiring, after all, only the application of general hygienic principles. The prevention of soil pollution by proper privy arrangements will practically solve the problem; and the proper shoeing of the feet while in previously infected ground will prevent the ingress of the parasite through the skin. Hookworm is a disease of primitive sanitation and primitive mode of living.

The results of hookworm infection among recruits, the infection of communities wherein they are stationed and in the country wherein they are to fight, are so serious that no measure must be omitted that will prevent the entry of actively infected individuals from entering the military organization. If entry has nevertheless been effected there should be no discharge before isolation, treatment and cure. In the prevention of the spread of this disease in this manner it would be quite feasible to examine each recruit for the presence of hookworm before admission to the military organizations. It has been suggested that the central laboratory method of examination of all individuals by trained workers would be the most efficient, cheapest and least likely to admit of duplication. An examination that fails in this particular, fails in a very vital element; and the expense of making these examinations would hardly equal the expense of maintaining the individual cases of disability.

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VENEREAL INFECTION IN SOLDIERS, SAILORS, AND IMMIGRANTS.

The mobilization of troops presents perhaps no greater sanitary problem than the prevention of venereal infection among them. It is said that venereal infection is the cause of the greatest amount of disability among troops. So large a factor has this been that military medical officers have devised and adopted the so-called prophylactic packet—20 per cent. calomel ointment, against syphilitic infection, a certain silver preparation against gonorrhea—to prevent infection. So much confidence is placed in the prophylactic value of the packet that infection with venereal disease is accepted as absolute evidence of failure to use it, and the disobedience is accordingly punished. This method has been criticized as encouraging immorality, but attempts to control venereal infection anywhere by moral suasion, segregation of prostitutes and the like have proven to be failures.

Yet in spite of the reputation of the soldier, and especially the sailor, for venereal infection, and the great pains taken to prevent it, there is no real evidence that, except for this timeworn reputation, they are more subject to venereal infection than other classes. It is barely possible that venereal infection is detected more frequently in the active stages in the soldier and the sailor than in other classes, but that is only because from the very nature of their calling they are subject to physical examination more frequently than others. Perhaps no other imputation has contributed so unjustly to the disrepute of the soldier and sailor than the imputation of almost universal venereal infection. When, however, the fact that venereal infection is widely distributed, skipping no classes, is understood; that the estimates of venereal infection at one time or another among all classes is even above 80 per cent.; that the number of marital, but innocent, infections among females is very large, and that it has been deemed necessary in many States to pass laws against the marriage of infected persons, it can be seen that venereal infection is hardly limited to the soldier or sailor. Moreover, the chance of exposure to venereal infection is much greater in civilians than in soldiers or sailors, because the former are continually exposed to infection, while the latter only for short and often far-removed periods between service. With the training of the soldier in modern times in general health and disease prophylaxis, the likelihood of infection will be much reduced, and perhaps to a lower degree than in any other class.

The same sort of misapprehension has existed in the popular mind about the importation of venereal disease by the immigrant. It is quite likely that the more cultured immigrant from the city is subject to the same degree of infection as the city people of this country. There is no evidence of any greater amount of infection. Only the actual amount of venereal infection can be increased by his importation but not the percentage. But in respect to the European peasant that emigrates to this country, whose previous life has been very primitive, and who, in keeping with all primitive life, has married early, the amount of venereal infection is negligible. Indeed, in so far as the peasant immigrant is a primitive being, it is he who becomes infected by the civilization into which he enters, just as it was the civilized peoples who introduced venereal and other diseases into the primitive peoples whom they attempted to develop.

Venereal disease is limited to no class but, rightly called, is a social disease, and correctible ultimately by the correction of social and other errors of living. In the meantime it must be controlled by medical prophylaxis.

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MEDICAL NOTES.

State of Illinois Department of Public Health.—The Fiftieth General Assembly of the State of Illinois passed a consolidation bill which became law July 1, 1917. This bill, known as the Civil Administrative Code, created the Department of Public Health, abolished the State Board of Health, secretary and executive officer of the State Board of Health, and vested the power to enforce the State Board of Health Act in the Department of Public Health.

All correspondence of an official nature, all bulletins and reports should be addressed to C. St. Clair Drake, M.D., Director, The Department of Public Health, Springfield, Illinois.

Brady Bequest to New York Hospital.—An arrangement has been made by the executors of the estate of the late James Buchanan Brady and his heirs so that $3,000,000 of his fortune may be used at once by the New York Hospital. This makes possible the establishment of the James Buchanan Brady Foundation of Urology, for which a building will be erected to cost about half a million dollars. The plans for the foundation are in the hands of Dr. Oswald S. Lowsley, named by Mr. Brady as director.

Rockefeller Foundation.—Two hospitals in China, one at Peking and one at Shanghai, are to be built by the Rockefeller Foundation. The Foundation is also to send a hospital ship to the Moros and allied tribes of the Sulu Archipelago where it will cruise for five years among the islands in the Southern Philippine group, treating skin diseases, malaria, hookworm, dysentery and other tropical affections.

Meeting of Orificial Surgeons.—The annual meeting of the American Association of Orificial Surgeons will be held in Chicago on September 27, 28 and 29. Morning hours are to be given to clinics, and afternoon and evening sessions to papers and discussion. Dr. Benoni A. Bullock of Detroit, Mich., is secretary for the Association.

WAR NOTES.

Unit for Physical Treatment.—Following is a synopsis of the unit which the American Electro-therapeutic Association would recommend to accompany every military hospital at the front and at the base.

1. *Purpose.*—The purpose of the unit is to furnish facilities and men to carry out in a thoroughly scientific manner treatment, by electrotherapeutic and other physical methods, of diseased conditions arising from injuries and from other causes associated with exposure of our men in the Army at the front.

2. *Scope.*—(*a*) Includes the treatment of infected wounds, delayed repair following injury, beginning gangrene, sprains, contusions, atrophies, various forms of arthritis, erysipelas, frost-bite, trench feet, flat-foot, and neuritis. (*b*) Instruction to physicians and nurses in preparation for the above work.

3. *Capacity and cost.*—In order to carry out this work properly, sufficient funds must be provided thoroughly to equip and maintain a unit. The committee recommends that such a unit form a part of every base hospital in this country and abroad. There are qualified physicians in readiness to fill these positions.

4. *Equipment.*—Equipment should include transformers and diathermic apparatus, x-ray apparatus for therapeutic use, the practical forms of static machines, therapeutic lamps, sinusoidal machines, and constant current apparatus.

American Red Cross in Russia.—Word has been received that the Commission sent to Russia under Dr. Frank S. Billings of Chicago, has arrived safely and has been duly received by Premier Kerensky. Upon receipt of this information Mr. H. P. Davison of the Red Cross War Council, cabled the following dispatch to Premier Kerensky:

"I have just received a cable announcement of the safe arrival in Petrograd of the American Red Cross Commission to Russia. The American Red Cross numbered nearly 3,000,000 American citizens, and wants you to know that the sending of this commission with the measures of relief which it conveys, and the others which, we expect, it will later administer, are tokens of the earnest sympathy of the American Red Cross for the people of Russia in their brave struggle for the establishment of democracy and for the perpetuation of a really independent national existence. The American Commission carried with it medical supplies to the value of $200,000. A second shipment of supplies is now being sent to Russia by the Red Cross. To cover this shipment the war council has appropriated $160,000."

Commission for Serbian Relief.—The American Red Cross has appointed Dr. Frederick T. Lord and Dr. Eugene A. Crockett of Boston, and Dr. Severance Burrage, formerly of Boston, to constitute a commission to conduct relief work in Serbia.

War Hospital in New York.—Columbia Hospital, New York City, has been accepted by the Government and has been designated as United States Army General Hospital No. 1. This hospital is to be one of a series of general hospitals where men requiring prolonged periods of treatment, can be sent and thus relieve hospitals located nearer the front.

British Dental Association.—At the annual meeting of the British Dental Association held on July last, it was announced that of the 2.600 members of the Society, 600 were in military service either as dentists or as combatants. It was suggested that on the plan of the Canadian Army Dental Corps, the British Army organize a similar corps.

Military Orthopedics.—The new department created by the Surgeon General known as the Department for Military Orthopedics, under the directorship of Maj. Elliott G. Brackett, will have its headquarters at the surgeon general's office. Maj. David Silver, M.R.C., is assistant director. The office of director of military orthopedics for the expeditionary forces will be filled by Maj. Joel E. Goldthwait, M.R.C. Maj. Robert B. Osgood, now serving with United States Base Hospital No. 5, and Capt. Nathaniel Allison, now serving with United States Base Hospital No. 21, will be transferred from their present positions to the same department, Maj. Osgood being assigned to the British forces, and Capt. Allison to the French and Italian forces. An advisory board has been appointed to assist the directors of the department, to which the following men have been appointed: Dr. Robert W. Lovett, Boston; Dr. Albert H. Freiburg, Cincinnati; Dr. G. Gwilym Davis, Philadelphia; Dr. F. H. Albee, New York; and Dr. John L. Porter, Chicago.

Bureau of Sanitary Service.—The War Council of the American Red Cross has appropriated $800,000 for the establishment and maintenance of a Bureau of Sanitary Service to be under the leadership of Dr. W. H. Frost. This bureau is created for the purpose of caring for the sanitary and health conditions of mobilization camps and their environments. The Bureau is prepared to furnish sanitary units either to aid or supervise in such work and will do so upon request of proper civil authority. Units will consist of bacteriologists, sanitary inspectors, nurses and assistants. Dr. Frost has been with the Public Health Service for thirteen years and was active in the yellow fever epidemic of New Orleans in 1905.

Appointments to Dental Corps.—It is reported that Dr. Albert Holman Staples of Brunswick, Me., has received a commission as first lieutenant in the Dental Section, Officers' Reserve Corps, U. S. A.

Demonstration By Drs. Carrel and Dakin.—On August 12, the Rockefeller Institute for Medical Research formally opened its war demonstration hospital. The occasion was marked by a visit to that institution of the National Medical Council to study the methods of wound treatment by Drs. Carrel and Dakin. There were present beside Surgeon-General Gorgas and Dr. Franklin H. Martin of the Medical Bureau of the Council of National Defense, their staffs and a large number of army and medical reserve officers, the medical members of the British war mission and representatives of the French medical service. Dr. Carrel demonstrated the Carrel-Dakin method of wound irrigation and discussed methods of training medical officers in its use. Surgeon-General Gorgas made arrangements for a large number of officers to take a course in wound treatment under Dr. Carrel at the institution. The serum for the treatment of gangrene was demonstrated and it was announced that its use had progressed to a point where it might be used on human beings. A large number of horses have been inoculated with the bacillus and are now producing the serum, which will be furnished to the medical forces of the Allies.

Gift of Dental Ambulances.—It is announced that through the generosity of Mrs. William B. Thompson, the New York State troops will be provided with five dental ambulances. Money is being raised through the Preparedness League of American Dentists to equip an additional number of ambulances for the American Expeditionary Forces. The League states that twenty-seven per cent. of the men who apply for enlistment are rejected because of defective teeth.

Military Hospital on Gallop's Island.—It is reported that Gallop's Island is under consideration as a possible site for a military hospital. The island now harbors 270 interned Germans.

Hookworm Among American Recruits.—Dr. Wardell Stiles of the Public Health Service has recommended careful examination of all recruits of the National Guard and the National Army, especially in the South, for the detection of hookworm. Recently in the examination of seventy-five recruits, hookworm was found present in forty-seven of the number. Dr. Stiles calls attention to the great danger of carrying the infection abroad, and urges thorough and systematic examination of all troops.

Medical Research.—The American Red Cross has appropriated $100,000 to be used in medical research work in France. This is in pursuance of a recommendation of Major Grayson M. P. Murphy, Red Cross Commissioner to Europe, who sent the following message to the Red Cross Headquarters:—

"An extraordinary opportunity presents itself here for medical research work. We have serving with various American units, some of the ablest doctors and surgeons in the United States. Many of these men are already conducting courses of investigation which, if carried to successful conclusions, will result in the discovery of treatments and methods of operation which will be of great use, not only in this war, but possibly for years afterward. To carry on their work they need certain special equipment, and personnel cannot be obtained through ordinary government sources without delay, which makes this source of supply quite impracticable."

American Medical Activities In France.—French military authorities have turned over to the medical corps of the United States Army, two large military hospitals and a large medical depot. These will be occupied by American base hospital units. The entire American force in France has been inoculated against typhoid and para-typhoid. A great field laboratory is under construction near the American training camp.

Johns Hopkins Unit In France.—Johns Hopkins Hospital announces that the unit sent from its staff is now established in a base hospital in France, equipped for work. The various members of the staff have returned from their inspection of specializing hospitals and have divided the work of the hospital as follows:—

Dr. William S. Baer, the orthopedic surgeon, is specializing in wounds of the legs and feet; Dr. B. H. Bernheim in vein surgery; Dr. John J. Heuer in skull surgery; Dr. William Fisher, Jr., in abdominal wounds, and Dr. John S. Davis in skin grafting. Major J. M. T. Finney, head of the unit, is the general surgeon.

Sickness Among Troops In France.—Report of sickness among American troops in France shows that whereas the rate in Army posts in the United States is 5 per cent., that in France is but 2½ per cent. Most of the sickness is made up of light cases of mumps, measles and colds.

Veterinary Corps.—The following men have been appointed to the advisory board for the Veterinary Corps of the Army: Dr. C. J. Marshall, Pennsylvania; Dr. David S. White, dean of the College of Veterinary Medicine, Ohio State University, Columbus, O.; Dr. Louis A. Klein, dean of the School of Veterinary Medicine, University of Pennsylvania; Dr. V. A. Moore, dean of the New York State Veterinary College, Cornell University, Ithaca, N. Y.; and Dr. John R. Mohler, assistant chief of the Bureau of Animal Industry, Washington, D. C.

War Relief Funds.—On September 6 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund ..	$250,748.40
Children's Fund	214,116·17
Surgical Dressings Fund ..	122,634.70
Serbian Hospitals Fund ..	101,837.89
Polish Fund	84,595.95

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—There were 217 deaths in Boston for the week ending Sept. 1, 1917, against 247 the corresponding week last year. The death rate was 14.65.

There were the following cases of communicable diseases reported: Diphtheria, 53; typhoid fever, 13; whooping cough, 18; scarlet fever, 21; measles, 16; tuberculosis, 63. Of these there were non-residents as follows: Diphtheria, 5; scarlet fever, 7; measles, 1; whooping cough, 2; and tuberculosis, 6.

The deaths from communicable diseases were as follows: Diphtheria, 5, non-resident, 1; scarlet fever, 1; typhoid fever, 1; whooping cough, 6, non-resident, 1; tuberculosis, 29, non-residents, 3.

The deaths under one year were 46, non-residents, 9.

Nantucket Cottage Hospital.—An appeal is made for the support of the Nantucket Cottage Hospital, established in 1913, and since that time doing excellent work in a district unassisted by hospital help of any kind. In view of the increasing demands made upon it and in consideration of the position of the island, which will render it of great service in the event of war in these waters, it is the determination of its trustees to strengthen its support and enlarge and equip it to meet its present needs and possible emergencies. Through Mary E. Waller of Nantucket, Mass., it asks that contributions may be forthcoming to aid it in its increased usefulness.

Pregnancy Clinic.—The prenatal and obstetrical clinic held at the Out-Patient Department of the Peter Bent Brigham Hospital, under the auspices of the Women's Municipal League and in affiliation with the Boston Lying-in Hospital, reopened for the admission of patients on August 22. This clinic is established for persons of moderate means, in order that there may be available for them that care which the rich can afford and which the poor have given them.

The clinic offers to its patients the care of the most thoroughly trained obstetricians, with the help of a trained nurse, and includes visits by the patients to the prenatal clinic held every Wednesday from 3 to 5, by the doctors with the nurse in attendance; home visits to the patients by the nurse at least every ten days; the presence of both doctor and nurse at the delivery, and the customary number of visits for the aftercare of mother and child.

The charge for this is $25, with a small extra charge for ether if it be required. The patients will be taught to make their own surgical supplies out of materials sold to them at wholesale rates, and these, when made, will be sterilized for them.

Meeting of Industrial Accident Boards.—At the evening session of the second day of the fourth annual meeting of the International Association of Industrial Accident Boards and Commissions, held in Boston, the subject under discussion was "Medical Competence and Hospital Efficiency." The speakers were Dr. F. D. Donoghue, medical adviser of the Massachusetts

Accident Board; Dr. J. W. Sever, Dr. F. J. Cotton, Dr. E. A. Codman and Dr. E. E. Southard. Dr. F. D. Patterson of the Pennsylvania Department of Labor and Industry, presided.

At the afternoon session, which was devoted to a discussion of compensation insurance, papers were read by Dr. W. A. Brooks, Dr. Timothy Leary, Dr. A. W. George, Dr. J. W. Brickley and Dr. W. Irving Clark.

The delegates were invited to attend the occupational diseases clinic of the Massachusetts General Hospital.

The Massachusetts Medical Society.

UNEXPIRED LEASES OF ENLISTED PHYSICIANS.

THE Chicago Rotary Club has learned that a great number of physicians, who have enlisted for service during the present war, are embarrassed by unexpired leases. In certain cases, such corporations from whom they rent have refused to cancel leases. It seems to the Chicago Rotary Club that when physicians are so much needed in the United States Army, every effort should be made to relieve them of contracts rightfully binding in times of peace, but which might better be waived in times of national peril.

We all know that the physician giving up an established practice to enlist, makes perhaps the biggest sacrifice of us all, because his business depends absolutely on personal contact. The day he leaves, his business ceases. But his lease goes on. Yet our country is calling for more physicians, and many patriotic doctors everywhere are trying to arrange their affairs to go.

It is possible to create a strong public opinion favoring the canceling of leases in such cases. If advisable, the matter can be carried for consideration to Congress. But first, the Physicians' Lease Committee wants figures and facts. We are sending this letter to 20,000 physicians scattered all over the United States. May we ask you personally to help us by promptly filling out and mailing to us a postal card, telling us if you have knowledge of such leases.

Your prompt co-operation will place in the hands of your committee the necessary data for an effective presentation of the facts before proper legislative bodies.

We want to help. We believe, in fairness to all, a great work can be done. When we receive your card, you will have our earnest thanks for your co-operation.

CHICAGO ROTARY CLUB,
PHYSICIANS' LEASE COMMITTEE,
R. R. DENNY, *Chairman*,
Care of Dennos Food Sales Co., Chicago, Ill.

NOTES FROM THE DISTRICT SOCIETIES.

DISTRICT CORRESPONDENTS.

Berkshire, A. P. MERRILL, M.D., Pittsfield.
Bristol North, ARTHUR R. CRANDELL, M.D., Taunton.
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.
Essex North, T. N. STONE, M.D., Haverhill.
Essex South, H. P. BENNETT, M.D., Lynn.
Hampden, LAURENCE D. CHAPIN, M.D., Springfield.
Hampshire, E. E. THOMAS, M.D., Northampton.

ESSEX SOUTH.—At a meeting of the Beverly Medical Fraternity, held August 27, 1917, the following resolution was adopted:

"In realization of the sacrifices assumed by members of our profession enlisted in the National Medical Service, we, the undersigned, wish to assign to the use of the families of the physicians so absent, a definite portion of the fees received by us from patients formerly employing these physicians. For this purpose we pledge ourselves."

(Signed by Members of the Fraternity)

It was voted that one-third of the fees collected be apportioned to the men absent in the National Medical Service, and be deposited in the Beverly National Bank to the credit of the joint account of the absent member and his wife.

A copy of the resolution to be posted in the offices of the physicians.

RALPH E. STONE, *Secretary*.

ESSEX NORTH.— Lawrence doctors who have been already ordered into the service are: Maj. H. H. Davis, National Guard, Boxford; Captain J. F. Burnham, Fort Benjamin Harrison; Lieut. W. M. Crandell; Lieut. J. M. Scanlon, Army Medical College, Washington; also Lieut. H. A. Clark, North Andover.

W. H. MERRILL, M.D., *Reporter*.

FRANKLIN.—The following appeal has been sent to all physicians in the district:

"About the middle of April the Franklin County Branch of the Massachusetts State Committee for Medical Preparedness was organized at a meeting called by Dr. Howe of Greenfield, President of the Franklin District Medical Society.

"At this meeting ways and means of encouraging members of the profession in Franklin County who are eligible to join the Officers Reserve Corps were discussed, and it was decided to send to each individual a personal appeal, but before the latter could be prepared, the State Committee on Medical Preparedness sent out survey cards to every physician in the State and, as this attempt of informing our profession seemed to be sufficent for the time being, nothing more was done by this Committee.

"Now, however, we learn that a great many of the cards sent out have not as yet been returned properly filled out. How many of these failures come from our county we are not now in a position to say, and though we believe that no physician in Franklin would intentionally fail to supply the information desired, or to do everything possible to discharge his part of the obligation assumed when our government declared war, yet because it is possible that some of us have overlooked the matter and have not yet given the need the very serious consideration it deserves, we desire to call your attention to the following:

"Fifty-eight hundred survey cards were sent out and only 3500 were returned. Are you one of the delinquents?

"2. Have you seriously considered the help that you might render by joining the Officers' Reserve Corps and that you are eligible if between the ages of 22 and 55 and can pass the required physical examination?

"3. Do you realize that an early, and, we hope, a successful, outcome of this horrible affair can be brought about only by a quick, hard punch from this country, and that such a punch can be maintained only by having the medical arm as numerous and as efficient as possible?

"4. Do you recall the condition of the returning soldiers in 1898, and didn't you individually resolve that if the medical profession ever had another chance you would do your bit toward reducing the terrible toll which disease took then as it always had done in other wars?

"5. Have you done anything to ascertain the real need for your services at this time? If not, won't you mull over these facts:

"Over 25,000 medical men will be needed to keep the proposed National Army in good physical condition while they are in training.

"That France today would not be honeycombed with tuberculosis if her medical arm could have been more numerous and they could have had a keener sense of the importance of sanitation as a preservative of armies.

"That England has been obliged to put her hand on every medical man under 57 years of age.

"That there are often ten, fifteen and even twenty thousand soldiers to the mile of trenches on the western front with all that that congested number means in the promotion of disease.

"That when such battles as that of the Somme, Arras and Ypres open, there may be twenty to thirty thousand wounded during the first hour.

"That no medical man can offer any conscientious objections to service because all of his work is constructive rather than destructive.

"That the reward in experience and prestige is greater than any service an individual may be able to render.

"That medical men have never failed to respond to a call for service.

"(Signed) Franklin County Committee for Medical Preparedness."

Miscellany.

THE DRAFTING OF MEDICAL STUDENTS.

The Mayor's Committee on Hospital and Medical Facilities in New York, which advocates the retention of medical students in the medical schools and of hospital internes in the hospitals under army assignment, with the object of keeping the army supplied with young medical graduates throughout the period of a long war, has halted its preparations for the introduction of a relief measure in Congress, owing to the receipt of word that the district boards of St. Louis and Cleveland have decided to exempt medical students under the law as it stands.

The district board of Cuyahoga County, which covers the city of Cleveland, has adopted and is acting on the following resolution:

"Resolved, It is the opinion of this board that men of the medical profession, including not only those who are regularly practising medicine, but also students of medicine, duly enrolled in any recognized school or college, should be temporarily discharged from service as being engaged in an industry which is necessary to the maintenance of the military establishment and the national interest during the emergency.

"It seems almost impossible to conceive of any form of activity in which a man is of more importance to his country at this period than in the medical profession. There is a great shortage of surgeons and other medical men abroad, and this country is being called upon to provide an ever increasing number for service at the front.

"The effect of this will, of course, be greatly to diminish the supply at home. It seems of prime importance, therefore, that those regularly practising be allowed to continue such practice until the government calls upon them for service in the capacity in which they can be most useful, and of equal importance, that students be allowed to continue their course of instruction in order that they may prepare themselves more perfectly for important duties at a later date.

"It will be the policy of this board in these cases, particularly in the case of students, to grant temporary certificates of discharge requiring the claimant to report at intervals and present proof to the board that he is continuing his studies in a manner satisfactory to his instructors and is making the progress which the board anticipates in granting the discharge."

In the discussion of this resolution, Chairman Johnson said:

"It is of the utmost importance that medical students should be kept in school until they have completed their studies.

"Medical students are performing, or will be capable of performing, much more important public service than men engaged in manufacturing plants. It is the most important service I can conceive.

"Although there have been different rulings on this question, I want it to go out from Cleveland that this district board of appeals is strongly in favor of exempting medical students.

"A year from now we know that these men will be badly needed, critically needed by their country. All the nations at war are terribly short of doctors."

The message from St. Louis reads as follows:

"August 28, 1917.

"Dr. S. S. Goldwater,
Mayor's Defense Committee,
New York, N. Y.

"Dear sir:—

"We are informed that the district board will exempt senior medical students who present individual claims for exemption. I enclose a form of affidavit which is used by students in the presentation of their individual claims to the district board.

(Signed) "H. W. LOEB, M.D., *Dean*,
"St. Louis University School of Medicine."

The form of affidavit referred to in Dr. Loeb's letter, follows:

"To the district board ....

"I hereby claim exemption from the draft in accordance with the provision of the act which authorizes the exclusion or discharge of 'persons engaged in industries, including agriculture, found to be necessary to the maintenance of the military establishment or the effective operation of the military forces or the maintenance of national interest during the emergency' for the following reasons:

"I. I do not desire in any way to evade service for my country during the war; on the contrary, I hereby offer myself for service in any of the special fields for which I shall be equipped when I receive my diploma in medicine, or if required by the regulations of the medical department of the United States Army and Navy, when I shall have completed my year of interneship.

"2. I am a student of medicine in the St. Louis University School of Medicine and expect to complete my work on .... The St. Louis University School of Medicine is one of the now comparatively few medical institutions engaged in the education of physicians as a distinct and proper industry 'necessary to the maintenance of the military establishment and to the effective operation of the military forces and to the maintenance of the national interest during the emergency,' in that the said institution takes the raw material, *viz.*, the college student, and, after due process, places him at the service of the public as its finished product, *i. e.*, the qualified physician or surgeon.

"3. By reason of the increased range of the science and art of medicine and the consequent greater amount of time necessary to perfect a student in medicine, the educational requirements have been greatly increased and the period of medical instruction greatly lengthened.

"4. The effect of this has been to reduce greatly the number of graduates representing the output of the various medical institutions which for the past fifteen years has been getting smaller and smaller.

"During the nine years from 1900 to 1908, inclusive, the output of medical graduates numbered 47,797; during the subsequent nine years ending 1917, the number was 33,725, a decrease of over 14,000. In 1900 there were 5,214 graduated, and in 1917, only 3,399, a decrease of 1,815.

"5. Many new fields have opened to medical men which absorb, year by year, an increasing number who do not enter the practice of medicine.

"6. If 1,000,000 men are called from the civil fields of work to serve in the army, it will only slightly modify the number of practitioners required from the civil population, while, according to the latest information, 7,000 medical men will be required to man the regiments constituted by them.

"7. It is said that more than 10,000 medical men have already joined the Officers' Reserve and that two or three times as many are desired. No man other than a physician can perform the work of a medical man and hence, in fulfilling the demand for such large numbers of trained men, great harm to the people and the nation may result if the supply as determined by the output of the medical institutions is not carefully conserved.

"8. Under instructions from the Medical Council of National Defense, and the Surgeon General of the Army, students were discouraged from enlisting and were consequently, through no fault of themselves, denied the opportunity of preparing themselves for the Officers' Reserve for which many of them, being college men, might have qualified.

"9. The experience of both England and France has shown that 'the maintenance of the military establishment, the effective operation of the military forces and the national interest during the emergency' were seriously threatened by permitting the enlistment of ungraduated medical students, and the output of physicians during the three years of war has, for this reason, been seriously reduced.

"10. For these reasons dependent upon the grave danger to the nation of interfering with the important industry of educating medical men, already greatly curtailed by the requirements of time and expense, I ask exemption until such a time when my training may be completed and when I may offer myself to my country as a trained man who is capable of rendering efficient service through the agency of medical science."

The New York City district board, under the jurisdiction of ex-Justice Charles E. Hughes, decided a week ago that it was powerless to do what the St. Louis and Cleveland boards have now done, but appreciating the urgency of the matter, appealed to Washington for a modification of the existing regulations.

The University of Alabama, which is one of the medical colleges heard from since the publication of the last returns, furnishes the highest percentage yet given of drafted medical students, reporting 57% of the class of 1918 drafted, 60% of the class of 1919, 37% of the class of 1920, and 50% of the whole school.

A note of alarm is sounded in a letter from the dean of the University of Mississippi, who reports that 30% of their students will be taken under the first draft, and not less than 50% under the second. The dean of the Mississippi school fears that medical students will become entirely extinct in the state. This year only twenty medical graduates have applied for medical licenses, as compared with sixty to seventy in previous years.

INFORMATION AS TO PHYSICIANS EMPLOYED UNDER CONTRACT.

The Surgeon General has authorized the employment of physicians under contract for limited service. The contract doctor is given a contract for a definite class of work at a definite place. At the termination of that work his contract can be annulled if so desired, or he can be continued in service and given another assignment. He is practically still a civilian, has received no commission and has been obliged to pass no physical examination. He acquires no claim against the government for disability incurred in the line of duty. He is obliged to wear uniform and has a compensation of one hundred and fifty dollars per month, with mileage for travel under order. The executive officers of the Surgeon General's office are very much opposed, and for excellent reasons, to offering commissions in the Medical Reserve Corps for temporary service. It will be best in the future to give men who can render only such temporary service contracts instead of temporary commissions, so that there will be only two classes of men: first, officers of the Medical Reserve Corps, commissioned for service during the war, and second, contract doctors employed for a comparatively brief period. Physicians accepted for the Medical Reserve Corps can take contracts for service until they have received and accepted their commissions, when the contract will be annulled.

It will be seen that the contract system enables the government to make use of the large number of physicians who from partriotic motives are desirous of rendering some service, but feel themselves unable to accept a commission for service during the war.

INFORMATION FOR EXAMINERS ACCEPTING SERVICE AS CONTRACT SURGEONS.

Contract surgeons rank as first lieutenants. They are required to wear uniform at all times when on active service. They wear the caduceus and the first lieutenant's bar, but no other insignia. The uniform designated is of olive drab cloth, either woolen or cotton. Cotton is much cheaper and is desirable during the summer and in warmer climates. Ready-made suits can be obtained for $16 in Washington and can be had at still more reasonable prices in some other places. The most economical arrangement is to have one cotton suit upon leaving home and, if other clothes are needed, to obtain such as are issued to the soldiers from the quartermaster, who will probably be able to supply them at camp. Olive drab woolen suits cost not less than $40, made to order, but can be obtained much more cheaply ready-made and especially if obtained from the quartermaster. A woolen suit would not be necessary in warm weather. The campaign hat costs from $3 to $5. The best quality Stetson hat is more comfortable, but more expensive. The cord costs $1. Russet leather leggins and russet leather shoes are also required, but any russet shoes may be worn. Bedding must be provided. The simplest way is to wrap blankets and a pillow together with a telescopic field cot and such articles of clothing as will not be injured by rolling, in a piece of canvas which is securely tied with rope and checked as baggage. Toilet articles, etc., may be carried in a hand bag. The so-called locker trunk for officers is very convenient, but a bedding roll and hand bag will carry all of the necessities. A basin and tin cup will be needed at camp, but can probably be procured on arrival. Physicians are requested to take their own stethoscopes with them.

Officers and contract surgeons are entitled to mileage at seven cents a mile from their home address, as given at the time of their appointment, to their station of active duty, payable after the journey has been performed. To secure this mileage a special voucher, procurable from the quartermaster's pay officer at the camp, must be filled out and the order of appointment to duty attached to it. The order to the Adjutant General must, therefore, be preserved. Upon arrival at the camp, report should be made in person to the commanding officer, which is done by visiting the Adjutant, presenting your order, stating your name and that you desire to report for duty, giving the date of your departure from your home or previous station. The Surgeon of the camp will undoubtedly be glad to give any advice and assistance needed thereafter.

HOSPITAL SHIPS IN WAR TIMES.

THE following account of a hospital ship appears in a recent number of the *Lancet:*

A paper on his experiences afloat by Dr. Oudard, staff-surgeon of the French Navy, has recently appeared in the *Archives de Médecine Navales.* He notes that the French have long employed hospital ships in their colonial wars, and that indeed in 1877 they built the *Annamite* as a hospital ship. She turned out so well that five others followed her, giving in his experience greater satisfaction than can be obtained from any converted merchantman. He wishes to see a fleet of steady ships built, about 10,000 tons and 15 knots, leased in peace time to commercial companies as passenger steamers, available at once on the outbreak of war, and each carrying 600 bed cases in single-tier cots. This is done in Japan. The worst cases would be in a ward with two operating theatres adjacent, while a small room for dressing cases is to be annexed to each of the other wards. The ships are to be planned for easy loading without too steep gangways; that means, we suppose, a suitable entry-port or baggage port on each deck; doors and passageways are to be wide enough to admit stretchers easily, and there are to be suitable derricks, or cranes, for hoisting and lowering patients in rough weather. These desiderata are quite in line with English practice, though we have few hospital ships specially built as such. He tells us of the help the French hospital ships were to the army at the beginning of the war, when the battles of the Yser were being fought, and the wounded were many. The ship would lie in a northern Channel port and at first she took the wounded as they were brought down by trains or ambulances, straight off the field. When the ship was as full as she could hold, about twice her calculated capacity, she would put to sea, and in a few hours discharge her patients somewhere in the west, every exertion having been made on board for the wounded, though little, except what was urgently necessary, could be achieved. Still, the wounded were greatly better off on shipboard, the pitching and rolling of a ship being far better borne, particularly by fracture cases, than the constant jolting of a train. Later on, as additional hospital ships came into service, they were less hurried, and could lie at bases, doing the duty of comfortable base hospitals, in France, at Mudros, and elsewhere. Popular report in the army credits the French hospital ships with a great deal of good work. The question of personnel is important. Dr. Oudard requires 10 orderlies for every 100 patients. In the hospital ships or barges used by the Austrians on the Danube and Save, and only employed over short distances, there were 12 orderlies for every 100 "lying" cases and four for every 100 "sitters."[1]

CANCER DECALOGUE PREPARED BY THE STANDING COMMITTEE ON THE CONTROL OF CANCER OF THE MASSACHUSETTS MEDICAL SOCIETY.

1. The classical signs of cancer are the signs of its incurable stages. Do not wait for the classical signs.

2. Early cancer causes no pain. Its symptoms are not distinctive, but should arouse suspicion. Confirm or overthrow this suspicion immediately by a thorough examination and, if necessary, by operation. The advice, "Do not trouble that lump unless it troubles you," has cost countless lives.

3. There is no sharp line between the benign and the malignant. Many benign new growths become malignant and should, therefore, be removed without delay. All specimens should be examined microscopically to confirm the clinical diagnosis.

4. Precancerous stage. Chronic irritation is a source of cancer. The site and the cause of any chronic irritation should be removed. All erosions, ulcerations, and indurations of a chronic character should be *excised.* They are likely to become cancer.

5. Early cancer is usually curable by radical operation. The early operation is the effective one. Do not perform less radical operations on favorable cases than you do on unfavorable ones. The chances for a permanent cure are proportionate to the extent of the first operation. Make wide dissections; incision into cancer tissue in the wound defeats the object of the operation and leads to certain local recurrence.

6. Late cancer is incurable, though not always unrelievable. Radium, x-rays, ligation, cautery, or palliative operations may change distress to comfort and may even prolong life.

7. Cancer of the breast. All chronic lumps in the breast should be removed without delay. Benign tumors can be removed without mutilation. Examine all specimens microscopically. An *immediate* microscopical examination is desirable since, if positive, it permits a radical operation at the same sitting. A radical operation performed ten days after an exploration is almost never successful in curing cancer of the breast.

8. Cancer of the uterus. Any irregular flowing demands thorough investigation. Offensive or even very slight serous flows are especially suspicious. Curette and examine microscopically. Amputate all eroded cervices which do not yield promptly to treatment. Do not wait for a positive diagnosis.

9. Cancer of the digestive system is difficult of early diagnosis, and therefore unfavorable in prognosis. All persistent and recurring indigestions (more especially if attended by change of color and loss of weight) and any bleeding

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[1] Military Surgeon, Vol. xl, p. 651, June, 1917.

or offensive discharges demand prompt and thorough investigation. Do not wait for a positive diagnosis.

10. Cancer of the skin. Any warts, moles, or birthmarks which enlarge, change color, or become irritated, should be removed promptly. They are likely to become cancer. Do not wait for a positive diagnosis.

UNITED STATES CIVIL SERVICE EXAMINATIONS.

SEPTEMBER 18, 1917.

Experts in the Prevention of Infant Mortality.

The United States Civil Service Commission announces an open competitive examination for experts in the prevention of infant mortality, for both men and women. Vacancies in the Children's Bureau. Department of Labor, at salaries ranging from $2,400 to $3,600 a year, with actual traveling expenses and a per diem in lieu of subsistence while absent from headquarters on official business, and in positions requiring similar qualifications, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

The duties of appointees will be to plan and conduct investigations into the causes of infant, child, and maternal mortality in selected communities, rural and urban; into the methods of their prevention; and into dangerous and injurious occupations and other matters relating to the health of children. Appointees may also be required to investigate maternal and child welfare through the holding of conferences

Competitors will not be required to report for examination at any place, but will be rated on the following subjects, which will have the relative weights indicated, on a scale of 100: (1) Education and experience, 70; (2) Publications or thesis, 30.

Graduation from a medical school of recognized standing and at least three years' specialization in the hygiene and diseases of childhood, or in the prevention of infant and child mortality by public or private agencies, are prerequisites for consideration for these positions.

Under the second subject, the applicant may submit publications on matters pertaining to child hygiene or the prevention of infant and child mortality, or a thesis on one of these subjects, or both such publications and thesis.

Statements as to education and experience are accepted subject to verification.

An oral test will be given at selected centres on a later date. In order to be eligible for the oral test competitors must attain an average percentage of at least 70 in education and experience and the publications or thesis. The oral test will be given to competitors in the order of their average percentages in the above subjects, and only to such number as will be necessary to meet the needs of the service. A competitor who fails to pass the oral test will not be eligible for appointment. Competitors will be notified of the date and place of the oral test.

Applicants must not have reached their fifty-fifth birthday on the date of the examination.

Applicants will be admitted to this examination regardless of their residence and domicile; but those desiring permanent appointment to the apportioned service in Washington, D. C., must have been actually domiciled in the State or Territory in which they reside for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

This examination is open to all citizens of the United States who meet the requirements.

Assistants in the Prevention of Infant Mortality. (Female).

The United States Civil Service Commission announces an open competitive examination for assistants in the prevention of infant mortality, for women only. Vacancies in the Children's Bureau, Department of Labor, at salaries ranging from $1,800 to $2,400 a year, with actual traveling expenses and a per diem in lieu of subsistence during absence from headquarters on official business, and in positions requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

The duties of appointees will be to assist in conduction in rural and urban communities investigations into the causes of infant, child, and maternal mortality, and into community measures for their prevention, especially into infant, prenatal and obstetrical nursing and care; and to make reports on these subjects with recommendations for improvement in such care, based on the experience of successful work in other communities.

Competitors will not be required to report for examination at any place, but will be rated on the following subjects, which will have the relative weights indicated, on a scale of 100: (1) Education and experience, 70; (2) Publications or thesis, 30.

Graduation from a school of nursing connected with a general hospital having a daily average of thirty patients or more, after a continuous hospital training of not less than two years is a prerequisite for consideration for these positions. This education shall include practical experience in caring for men, women, and children, together with theoretical and practical instruction in medical, surgical, obstetrical, and children's nursing. Special credit will be given for academic training in addition to the specialized education required.

In States having nurse-practice laws, registration is also a prerequisite for eligibility.

In addition to the above prerequisites, the applicant must have had at least eight months' study at a school of recognized standing giving postgraduate work in public-health or visiting nursing and at least two years' experience in infant and maternal welfare nursing, or in public-health or visiting nursing which has included these branches. Five years of executive work in public-health or visiting nursing will be accepted in lieu of the eight months' postgraduate work in public-health or visiting nursing.

Under the second subject the applicant may submit publications on matters pertaining to infant or child welfare, prenatal and obstetrical nursing, or to community work for the prevention of infant and child mortality, or a thesis on one of these subjects, or both such thesis and publications.

Statements as to education and experience are accepted subject to verification.

An oral test will be given at selected centres on a later date. In order to be eligible for the oral test, competitors must attain an average rating of at least 70 per cent. in education and experience and the publications or thesis. The oral test will be given to competitors in the order of their average percentages in the above subjects and only to such number as will be necessary to meet the needs of the service. A competitor who fails to pass the oral test will not be eligible for appointment. Competitors will be notified of the date of the oral test.

Applicants must not have reached their fiftieth birthday on the date of the examination.

Applicants will be admitted to this examination regardless of their residence and domicile; but those desiring permanent appointment to the apportioned service in Washington, D. C., must have been actually domiciled in the State or Territory in which they reside for at least one year previous to the examination and must have the county officer's certificate in the application form executed.

The medical certificate in the application form must be executed.

This examination is open to all female citizens of the United States who meet the requirements.

EXPERTS IN CHILD WELFARE.

The United States Civil Service Commission announces an open competitive examination for experts in child welfare, for both men and women. Vacancies in the Children's Bureau, Department of Labor, at salaries ranging from $1,800 to $2,400 a year, with actual traveling expenses and a per diem in lieu of subsistence during absence from headquarters on official business, and in positions requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The duties of such experts will be the planning, supervision, and writing of reports on special studies of the various aspects of child welfare which the Bureau is directed by law to investigate and upon which it is directed to report: "Infant mortality, the birth-rate, orphanage, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several States and Territories." Applicants should be specially qualified by training and experience for the direction of studies and for the writing for publication of clear, readable reports upon at least one of these subjects. Applicants may be required to plan and supervise field studies requiring knowledge of statistics and of statistical methods as well as of the methods and technique of field investigation.

Competitors will not be required to report for examination at any place, but will be rated on the following subjects, which will have the relative weights indicated, on a scale of 100: (1) Education and experience, 60; (2) Publications or thesis, 40.

As prerequisite for consideration for these positions the applicant must have an educational training at least equivalent to that required for a bachelor's degree from a college or university of recognized standing, such training to have included two or more years' special training in sociological or industrial subjects; and at least three years' experience in professional sociological or industrial investigation or research, or in professional journalistic or literary work including the writing of special articles primarily relating to sociological or industrial questions. This experience must have been of such a character as clearly to fit the applicant for the preparation of reports based either upon individual research or upon special field studies.

In considering equivalents for a bachelor's degree or college work credit will be given for experience in industrial or sociological work satisfactory to the Commission.

Under the second subject the applicant may submit publications on sociological or industrial subjects or on some subject connected with child welfare, or a thesis on any of these subjects, or both such publications and thesis.

Statements as to education and experience are accepted subject to verification.

An oral test will be given at selected centres on a later date. In order to be eligible for the oral test competitors must attain an average rating of at least 70 per cent. in education and experience and the publications or thesis. The oral test will be given to competitors in the order of their average percentages in the above subjects and only to such number as will be necessary to meet the needs of the service. A competitor who fails to pass the oral test will not be eligible for appointment. Competitors will be notified of the date and place of the oral test.

Applicants must not have reached their fiftieth birthday on the date of the examination.

Applicants will be admitted to this examination regardless of their residence and domicile; but those desiring permanent appointment to the apportioned service in Washington, D. C., must have been actually domiciled in the State or Territory in which they reside for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

The medical certificate in the application form must be executed.

This examination is open to all citizens of the United States who meet the requirements.

Applicants should at once apply for Form 2118, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Post Office, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn, Seattle, Wash., San Francisco, Cal.; Customhouse, New York, N. Y., New Orleans, La., Honolulu, Hawaii; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed and must be filed with the Commission at Washington, with the material required, prior to the hour of closing business on September 18, 1917. The exact title of the examination, as given at the head of these announcements, should be stated in the application form.

RECENT DEATHS.

ABNER TOOTHAKER WELLS, M.D., a fellow of the Massachusetts Medical Society, died in a sanatorium at Waukesha, Wisconsin, August 17, 1917, aged 44. Dr. Wells was born at Phillips, Maine, and was graduated from Baltimore University School of Medicine in 1899, and joined the Massachusetts Medical Society from Jamaica Plain in 1900. He had practised in Kendallville, Indiana, and in Canton, Ohio, of recent years. About a year ago he was in West Springfield, Massachusetts, living with his sister, Mrs. George E. Grover. He leaves another sister and four brothers.

HENRY WILLIAM CRONIN, M.D., died at Worcester, August 20, 1917, aged 54 years. He was a graduate of the College of Physicians and Surgeons, Baltimore, in 1893, and joined the Massachusetts Medical Society from Millbury in 1896, having practised in Worcester for many years.

HOMER H. WARNER, M.D., surgeon in the First Massachusetts Cavalry in the Civil War, died at his home in New York City on August 12. Dr. Warner was born in Norwalk, Conn., in 1837. In 1862 he was appointed surgeon and served throughout the war. He had been a member of the Old Guard for the past forty-two years.

CHARLES A. HAMM, a dentist in Brockton, Mass., was found dead at his office in that city. Death was due to natural causes. Dr. Hamm was born in Washington, D. C., in 1881, and graduated from Tufts Dental School. He had been in practice in Brockton for the past four years.

APPOINTMENT.

DR. WILLIAM H. WELCH, formerly head of the department of pathology at Johns Hopkins University, has been appointed director of the School of Hygiene and Public Health.

DR. W. G. MCCALLUM of Columbia University will succeed Dr. Welch in the position of pathologist at Johns Hopkins University.

The Boston Medical and Surgical Journal

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HEMORRHAGE: ACCIDENTAL, INEVITABLE, POSTPARTUM.*

By Robert L. De Normandie, M.D., F.A.C.S., Boston.

Of the varied types of hemorrhage to which the pregnant woman is liable, there are three which I wish to speak about tonight. The cause of the first two, we have no control over; the other one is caused usually by some error of the attending physician. The types of hemorrhage I refer to are the so-called accidental, the inevitable and the post-partum, anyone of which, when severe, or even when slight and improperly managed, may jeopardize the woman's life in a very short time.

A large percentage of the laity do not regard as serious a slight show of blood from the vagina during pregnancy, and I have begun to feel that not a few physicians hold a similar view. Until the laity is educated to the fact that bleeding during pregnancy is abnormal and calls for immediate and careful diagnosis as to its cause, until all physicians take this definite stand and act accordingly, we shall have a large mortality, some of which is nothing short of criminal, some of which, however, will always be unavoidable, even with the most expert medical care.

The causes of accidental hemorrhage are not thoroughly understood. In a way, the phrase "accidental hemorrhage" is unfortunate, for in only a small percentage of cases is an accident, trauma, responsible for this condition. Premature separation of a normally implanted placenta is an entirely adequate description of what occurs, but it is not concise.

Disease of the decidua or of the placenta, sudden shock, nephritis, or a toxemia have all been given as causes of this emergency. Possible mechanical causes, such as pulling off of the placenta by a short cord and separation of the placenta by sudden lessening of the size of the uterine cavity, I shall not consider.

There are two definite types of this condition characterized by the presence or absence of external bleeding. The first bleeding in this condition is always internal, concealed at the placental site—in other words, retroplacental. As the bleeding continues, the blood works its way downward between the chorion and the uterus and appears at the vulva. Therefore, an external show of blood when this condition is present, usually is an indication of much blood within the uterus. Not infrequently only a blood stained serum appears and this must always be regarded with suspicion and fear. The two types merge into one another and I would not lead you to infer that one may always distinguish the two.

The signs and symptoms in this condition are definite and usually very marked. To me, the one symptom suggestive of this condition is *abdominal pain*, sudden in onset, usually steady, severe in character, often excruciating, in a woman usually in the last two months of pregnancy. The pain is not infrequently localized over the placental site. The severity of the pain depends entirely upon the suddenness and completeness of the separation and whether the hemorrhage is entirely internal or not. The second chief sign is a change from normal of the feel of the uterus on palpation. This causes definite pain. Not infrequently combined with this is an alteration of the shape and size of the uterus. These two latter signs depend entirely upon the amount of internal concealed hemorrhage which has taken place. The change in the feel of the uterus is very marked; it is hard, board-like; the normal, soft feel, if labor has not begun, is absent, the normal alternate contraction and relaxation, if labor has begun, is absent. Hemorrhage is most variable, depending, as I have already suggested, upon the type the case under consideration is best classified under. Remember, it may be absent entirely or only a very slight amount of blood-stained serum may appear.

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* Read before the Springfield Medical Association, April 30, 1917.

The fetal heart shows marked alteration and in severe cases is lost entirely, for the fetus necessarily dies. The patient's pallor oftentimes is striking, in marked contrast to the amount of external bleeding that may be present. The pulse at the onset is only slightly elevated, usually under one hundred, the volume is small and the blood pressure is not always altered. Do not be deceived by the pulse, for even though the rate be slow, the moment any operative work is attempted, it at once goes to pieces.

Vaginal examination gives a normal lower uterine segment. The longer the duration of the bleeding, the more marked are the signs of the acute anaemia, and if the bleeding be chiefly internal the prostration of the patient is entirely out of proportion to the blood seen.

The diagnosis of this condition is not difficult, provided the condition is in mind. The sudden pain, the alteration of the feel and size of the uterus, the pain on palpation, the pallor, the prostration, the normal lower uterine segment, all point to the one condition.

In the differential diagnosis, placenta praevia is the one condition usually mixed up with it, but the only reason for the mistake is that the first condition is not considered. There are other conditions which might be considered in the differential diagnosis, but if the signs and symptoms as I have given them of this condition are carefully kept in mind, the diagnosis should not be confounded.

The prognosis of this very grave obstetric emergency depends entirely upon the correct diagnosis being made at once, and efficient and correct treatment immediately begun.

The treatment, without a question, is to empty the uterus with all possible speed with due regard to the patient's soft parts. The patient may be a multigravida or a primigravida, or she may be in labor. The os uteri may be dilated or readily dilatable or the cervix may not be taken up at all: all of these points must be determined and the proper treatment settled.

What is the proper treatment? There can be no one set treatment for this condition. There are too many variable factors. If the patient be a multipara with a soft cervix, completion of the dilatation with version and extraction will be the operation of election. If the patient be a primipara with rigid soft parts, such an operation,— an *accouchement forcé*,—a delivery by force, is, I believe, the worst possible treatment. Such a patient should have a Caesarean section, even if the baby is dead. In a few cases, especially in primiparous women who are in labor and the cervix is thinned, rupture of the membranes, insertion of a Voorhees bag, and minute doses of pituitrin will quickly bring about full dilatation, so the uterus can be emptied. When a case is managed this way, the uterus must be watched constantly,—its size, its action and its feel all will go to show whether the case is progressing favorably or not. The moment the bag passes the cervix, delivery should be completed as rapidly as possible. Again, in a similar case, a version with a slow extraction, a Braxton Hicks, is permissible, but the criticism of using either of these methods is that one never can be certain how much bleeding is going on within the uterus. If either of these methods is used, then firm counter pressure over the fundus and sides of the uterus must be insisted upon and this can be obtained by a Skultetus bandage, or by firm and constant pressure by assistants.

I have as yet had no experience with the use of a tight vaginal pack in these cases. The Dublin school favors this method, but in none of the cases of this condition that I have met have I felt justified in using it.

From the cases I have seen, the one essential element in whatever treatment is decided upon is time. The sooner treatment is begun the better will be the result. A delay of a few hours, minutes even, will materially alter the prognosis of any case. If you make a diagnosis of a separation of a normally implanted placenta, then you must empty that uterus at once. How best that is to be done I have already suggested. I am confident that much better results would come if more Caesarean sections were done early. It is true that many observers have noted that the uterus acts badly after this operation and have by necessity been forced to do a hysterectomy on account of bleeding, but some of these observers have waited several hours before operating after the diagnosis was clear. Once the diagnosis is made, speed in checking the hemorrhage is essential and in all cases where the soft parts are not readily dilatable, then Caesarean section, I am confident, is the operation of election.

Two cases will show you clearly my contentions:

The first, a ix-para, was admitted one evening to the Boston Lying-in Hospital, at 9.45, without any intelligent history obtainable, as she spoke no English. A physician sent her to the hospital with the diagnosis of placenta praevia. On entrance she had a pulse of 92, temperature of 97.4°, with slight bloody vaginal discharge. Her skin was dry, and the pallor was marked. Blood pressure, 160. The uterus, on inspection, showed a full-termed uterus. Palpation showed it to be very tense and exquisitely tender to the touch. No position was determined and no fetal heart was heard. Vaginal examination by the house officer showed the cervix to be rigid, the os dilated two inches, and no placenta felt. A bloody show was present. During the examination, her pulse went to pieces completely. She was stimulated, and given subpectorally salt solution. Her pulse came back and then was counted at 128. I had been notified that the patient was in the hospital and saw her about quarter past ten. My findings were the same as my house officer's. Her pallor was extreme, and she unquestionably was in the gravest condition. Her blood pressure at this time had dropped to 100. I felt that no matter what I did she would die, but that the safest way was to dilate her by vagina and deliver as quickly as the soft parts would allow. I hoped for an easy dilatation, as she was a multipara. Preparations for delivery were completed, and I passed two fingers through the cervix and obtained a foot. The membranes ruptured and a quantity of blood and blood-stained amniotic fluid came away. The cervix proved to be very rigid. Her pulse stayed about 130. Traction on the foot was begun at 10.45, and the delivery of a small, dead baby was completed in thirty minutes, with craniotomy to the after-coming head. The placenta and a gush of blood came away at once. During the delivery, constant pressure was kept on the sides and fundus of the uterus. Pituitrin and ergot were at once given. A hot intrauterine douche was followed by an intrauterine gauze pack. Her blood pressure at this time was but 60. Intravenous salt solution was given at once, but she steadily failed and died at 11.45. A catheter specimen of urine, which was obtained just before delivery, showed it to be of high color, acid, specific gravity 1015, with a very large trace of albumen. Sediment showed numerous red blood corpuscles, many hyaline and granular casts, with small round epithelial cells and red blood corpuscles adherent; a few epithelial casts; occasional white blood corpuscles.

From the urinary findings and the high blood pressure found on entrance, it is fair, I think, to assume that a toxemia of some type was present.

The next day a physician I knew well asked me if I had operated on this case, for he said he had seen this case at two o'clock in the afternoon, and that he had made the diagnosis of a separated placenta, and tried to send her to the hospital, but that the physician whose patient she was had arrived and taken charge, and so he withdrew. From my friend, I learned the patient had first had pain about ten a.m., but had obtained no medical aid until two p.m., when he saw her.

Here was a case where much valuable time was lost, for the diagnosis was first correctly made nine hours before the delivery was accomplished.

The second case was a primigravida at term. She was seen in consultation at seven-thirty one morning, at a private hospital, to which she had been removed by her physician. She gave the following story: At five-thirty this morning she got up out of bed and went to the bathroom to have a dejection, and as she came back to bed she was seized with a sudden sharp pain in the left lower abdomen. She then felt that there was moisture at the vulva, and on investigating she found she was passing blood. She at once sent for her physician and he saw her within the hour. At that time he found her having slight abdominal discomfort, with a rigid uterus. He did not make a vaginal examination, but took her at once to the hospital. When I saw her, her color was good. She was complaining of slight abdominal pain. Her pulse was 86 and of good quality. Palpation of the uterus showed a full-termed uterus, though apparently a small baby. The patient complained that palpation hurt her, especially on the left side. The contour of the uterus was normal. The uterus was harder than normal and it did not soften. No fetal heart was heard. Vaginal examination showed only a slight amount of dark-colored blood at the introitus; the cervix was not taken up; there was no sensation of bogginess in the lower uterine segment.

The physician said that her pregnancy had been normal, her blood pressure had not been over 120 mm. of Hg., and at no time had there been any albumen in the urine.

Our diagnosis was a premature separation of a normally implanted placenta. I advised that a Caesarean section be done at once, and I told the husband that I thought the baby was already dead. My advice was accepted and I at once opened the abdomen; coincident with the opening of the abdomen she was given ergot and pituitrin. As the uterus was incised, the membranes bulged and blood was seen coming from between the uterus and the membranes. Beneath the membranes was meconium-stained liquor. The baby, dead, was at once extracted. The placenta was found almost entirely separated on the left side. Between the membranes and the uterine wall was a thin layer of blood, over nearly three-quarters of the entire uterus. By the time the baby, placenta and blood clots were removed, the uterus was contracting well, and although there was bleeding, there was no question of doing a hysterectomy. The operation was speedily completed. At one time the pulse rose to 160. She went off the table with a pulse of 120 in fair condition. She made an uncomplicated convalescence, and at the present time is in the best of health.

These two cases stand in marked contrast to each other. A wrong diagnosis with delay, a correct diagnosis with no delay in the carrying out of the treatment,—a tragic result in the first and an excellent result in the second. Had the physician in the first case been willing to send his patient to the hospital early, there need not have been a mortality, for a saving of those several hours would have in all probability altered the outcome. Whether this patient would have survived, whether the hemorrhage would have been uncontrollable without a hysterectomy, is open to question on account of the toxemia which was present. The fact, however, is clear that hours were lost. It is this loss of time I insist must not occur if we are to improve the maternal mortality in this, one of the gravest of obstetric emergencies.

Now let me take up with you the second type of hemorrhage, namely, the inevitable,—inevitable because bleeding must take place before the contents of the uterus can be expelled. The placenta is ahead of the presenting part of the fetus. It is in some part of the lower uterine segment and therefore in an abnormal position; it is a praevia. The textbook division of the varieties is convenient for reference, and the usual one of complete or incomplete, with the further subdivisions of the latter into partial, marginal or lateral, is as satisfactory as any.

As to the etiology of a placenta praevia, I have nothing to say except that there is no satisfactory explanation for it. It is a fact, however, that it is much more frequent in multigravidae than in primigravidae.

In marked contrast to the onset of an accidental hemorrhage, a placenta praevia announces itself by bleeding, without pain, without apparent cause; not infrequently while the patient is sitting or lying down; quite commonly she is awakened by the warm blood trickling down her vulva.

This one sign in a woman pregnant more than three months, of bleeding without pain or cause, should make any thinking physician suspect even before he saw the patient that a placenta praevia was present.

For some years I have taught that any patient who showed bleeding from the vagina without pain in the latter half of pregnancy must be *regarded* as having a placenta praevia until it is conclusively proved that such is not the case. Remember, I do not say that every woman who bleeds without pain has a praevia.

Palpation of the uterus with this condition shows it to present the normal uterine feel, either of a uterus in labor, or not in labor. The presenting part not infrequently is quite high, because of the position of the placenta, and the position of the fetus may be abnormal for the same reason. The fetal heart is heard, or is absent, depending entirely upon the amount of bleeding which has taken place.

A vaginal examination gives almost without exception a very soft cervix, not infrequently a patulous os, especially if the patient is a multigravida. Further careful examination gives a boggy feel to the examining fingers in one or the other of the culs-de-sac or if the variety is complete over the entire vaginal vault. The examining fingers do not come directly to the presenting part.

The bleeding without accompanying pain, the presence of a boggy mass in the lower uterine segment, are the necessary points on which a diagnosis is based. I do not believe the statement that "in the absence of evidences of a toxemia it (this condition) is probably a placenta praevia" is correct.

There is one point in making a vaginal examination in a suspected praevia that must always be kept in mind. If the examining finger is passed through the cervix, as usually can be done with but little or no pain, and you open the sinuses, remember there may occur a tremendous hemorrhage, one which may seriously jeopardize the patient's life. Because of this danger, it is my custom to palpate carefully the culs-de-sac first and if the diagnosis is clear, never to touch the cervix until I am prepared to do more if necessity should arise. Occasionally bleeding is profuse and a vaginal examination gives unsatisfactory data; then I never hesitate to pass the finger through the os in order to palpate the lower segment. Remember however, that this never should be done unless everything is prepared for further treatment.

A recent case will explain more clearly my meaning about vaginal examinations in cases of possible placenta praevia.

A primigravida, 24 years old, in her eighth month, telephoned one evening that she was flowing very profusely. I went to her at once and obtained the following story. She was in the midst of taking a warm bath in the bathtub when she noticed that the water became red in color. She at once got out of the tub and found that blood still continued to run down her legs. She went at once to bed and placed at her vulva a heavy bath towel. I saw her within half an hour, and found that there still was a slight amount of fresh bleeding going on. By this time she had soaked through several layers of the towel. She stated that in the last few minutes the bleeding was distinctly less. Her pulse was 80, her color good. The uterus was soft, no evident contractions, and not tender to palpation. The fetal heart was regular.

I decided to take her at once to a nearby hospital and there make the necessary examination. She was at once prepared, and when all the preparations for operative interference were completed she was examined under rigid asepsis. She was given gas and oxygen, as at a previous vaginal examination it was found that she had a very tight introitus. No definite placenta was felt in the lower uterine segment through the culs-de-sac. The head was entering the pelvis. The cervix was very soft. Inspection showed that the blood was coming from the uterus. I determined to make positive that there was no partial previa, so I pushed a finger through the cervix, but in no portion that I could reach was there any placenta to be found. I gave her at once a quarter of morphia. The diagnosis was a slight detachment of a low-situated placenta. There was no indication to operate. Rest in bed, with small amounts of morphia and careful observation, was indicated. The next morning she passed a small amount of dark-colored blood and one or two small clots. The uterus was normal in its feel and the fetal heart was regular. At the end of a week she was sent home, not having had any further bleeding. Four weeks later she started up in labor and was delivered of a seven-pound baby by low forceps very readily. The placenta came away intact with all the membranes, and inspection showed one small portion at the periphery to be much darker and more firm than the rest of the placenta. The break in the amniotic sac was not noted as being close to the placenta.

Here was a case conservatively managed. Undoubtedly some of you will say radically treated because of the thorough examination. It is much better to cause an occasional patient to miscarry than to allow a possible praevia to go undiagnosed.

The prognosis in these cases is at the present time relatively bad, and it is bad for two reasons,—the first because an inevitable hemorrhage must occur, and how serious that will be no one can foretell. One single hemorrhage may kill. The second reason is because by far the majority of these cases are badly managed. Hospital statistics are no criterion for the prognosis which should hold in this condition. The patients are sent into the hospital not infrequently moribund and so the statistics are necessarily very high.

The prognosis for the child is very bad and is capable of but little improvement because of the fact of the hemorrhage and because so many of the babies are premature. In the treatment of this condition the first thing to do depends entirely upon the amount of blood already lost and whether the patient still is losing blood. It the hemorrhage is severe, a tight vaginal pack may be the only possible treatment at first. Such a condition is fortunately rare. The bleeding is caused by the normal intermittent uterine contractions which are constantly going on in pregnancy, opening the sinuses and allowing hemorrhage to take place. These sinuses, then, by the same normal contractions and retractions of the uterine fibres, close and the bleeding ceases. It is generally at this point that the physician arrives and must at once lay out an intelligent line of action.

Unquestionably a well-equipped hospital is the place to handle any bleeding case, but such hospitals are not always to be had. If the patient is not removed to a hospital, then complete preparations must be made for the delivery at home. What that means, there is no need of my going over with you tonight, but do let me warn you never to attempt a delivery of such a case without sufficient help. As in accidental hemorrhage, so in inevitable hemorrhage, the best treatment in any individual case will vary. Though the need for immediate delivery is not many times as urgent in this latter condition as in the former, no unnecessary delay is permissible.

The condition of the cervix is the chief underlying point in what treatment had best be given the individual problem, and this presupposes the determination of whether the patient is in labor or not and whether she had other pregnancies before this one. The size and the condition of the child is a further aid in helping decide what is the best treatment. If the child is full-termed and in good condition, we are, I think, justified in subjecting the mother to a slightly increased operative risk for the child's sake, unless the parents definitely demand that not the slightest risk be added to the mother's burden. Remember that the Catholic church holds a fetus cannot be deliberately sacrificed and this must be respected when operating in a Catholic family.

With these few general statements of the underlying principles of meeting this condition, let us go on to the separate methods to be employed.

In order to gain time to complete preparations for delivery, to check or lessen a severe hemorrhage and to start labor, a tight vaginal pack of sterile gauze is not infrequently permissible. But remember, the pack, to be efficient, must be tight and fill the entire vagina, going up against the placenta if possible. The pack is a preliminary procedure to emptying the uterus, usually by internal podalic version. Bleeding may take place between the placenta and the pack, and therefore the patient's general condition must be accurately followed.

Similar to the use of the gauze pack is the Voorhees bag. The bag is put in either extraovular or intraovular. Each position of the bag has its advocates, each has its advantages. The bag can be placed extraovularly, usually more readily than intraovularly, and in inserting it in this position, generally there is less bleeding than when the bag is thrust through the placenta. When the bag is placed beneath the placenta, the danger that more of the placenta will become detached, and bleeding take place between the placenta and the bag, is real and must not be forgotten, even though some of the advocates of this position of the bag say this accident does not occur. I have had better results, I think, with the intraovular position of the bag, especially in the incomplete varieties of this complication. In these incomplete varieties, the bag is thrust through the amniotic sac where there is no placenta. Some of the liquor necessarily escapes, but the bag is quickly filled with water, and all leakage of liquor stops. The largest size Voorhees bag measures three and a quarter inches and after not a few times using this bag in this complication, I decided to have a bigger one of the same type made. The bag I now put in measures four and a half inches across, and by means of its greater surface, the placenta is more efficiently compressed and therefore the bleeding stopped the better.

As soon as the bag passes the cervix, be sure and extract it at once over the perineum, for serious bleeding may take place if this is not done. As soon as the bag is out, then finish the delivery either by version or by forceps, depending upon the variety of the praevia the case presents.

A third method much in use is the so-called Braxton Hicks version. With a small, puny baby, probably dead at the beginning of the version, it is unquestionably the operation of election. If the baby is dead, no matter what its size, here also is it the operation of election. In performing this slow extraction, be sure and keep pressure over the uterus, over the fundus, for more than one internal concealed hemorrhage has taken place by failure to observe this simple precaution. A true Braxton Hicks, a very slow extraction, almost always sacrifices the baby; when the delivery, however, is speeded up, some of the babies will be saved. But by speeding up the delivery, the character of the delivery changes and we in reality are using the fourth method of treatment, namely, *accouchement forcé*.

Accouchement forcé, delivery by force, oftentimes a wicked divulsion of the maternal soft parts, has of recent years been rightly condemned. I am sure it has killed many more patients than it will ever save. This sudden, ruthless divulsion I am as much opposed to as anyone, but there can be done a manual dilatation with a woman in labor, or in a multipara with a soft cervix, so gently without tearing, that I am confident it is a justifiable thing to do. The cases in which it is justifiable must be picked; but to condemn absolutely, a careful manual dilatation, especially when the os uteri is partially dilated, is as wrong as it is to do a rapid divulsion and lose the patient from a ruptured uterus, as not infrequently happens. In doing a careful dilatation, with a patient presenting an incomplete praevia, I am more fearful of doing damage than when the praevia is of the complete variety. The reason for this is because of the great friability where the placenta lies, in marked contrast to the remainder of the os uteri. This reason does not hold in the complete variety, for here it is all soft and dilates much more readily and evenly. I would not give you the idea that I favor unreservedly a manual dilatation. I do not, but in certain cases I know it is justifiable, if not the operation of election.

There remains one more method to be considered, namely, Caesarean section. In the rare, picked case, it is the operation of choice. There are, however, certain facts which must be known before it should be attempted. These are, the mother must be in good condition and under no suspicion of being septic: her soft parts must be rigid and the baby must be in good condition. These conditions are not often fulfilled, and therefore it is not an operation to be done as a routine measure. It has been done many times and, as the saying goes, "the operator has got away with it." But does that justify our recommending it as the operation of election?

The third and last kind of bleeding which I want to speak about is that occurring after delivery of the child, and a further subdivision, secondary post-partum hemorrhage or puerperal hemorrhage.

Earlier in the paper, I said this type of bleeding was usually caused by some error of the attending physician. Now let me prove this. Someone has said that a physician's skill in obstetrics may, to some extent, be measured by the number of post-partum hemorrhages that he has had. This statement is simply putting in another way what I have already said.

The bleeding which occurs from lacerations is usually not profuse and does not, except in lacerations of the cervix, endanger the woman's life. The external bleeding, which occurs from tears about the clitoris, vaginal wall and perineum, are readily distinguished from uterine bleeding by inspection and by the fact that the uterus is hard and well contracted. Bleeding of this variety is stopped at once by sutures. Bleeding from a lacerated cervix is much more serious. The tear may be so deep into the broad ligament that death rapidly occurs. Bungling operating, through imperfectly dilated soft parts, or hurried deliveries in incomplete praevias are the chief causes for this type of hemorrhage. When death follows in these cases, it usually is caused by the fact that the uterus is ruptured, and bleeding into the broad ligament or abdominal cavity occurs, depending whether the rupture is incomplete or complete. A severe cervical tear which is bleeding should at once be sutured. If the tear runs off well into the broad ligament, packing the tear oftentimes gives better results than attempting to sew. If the uterus is ruptured, a hysterectomy must be considered, but consideration of that will take us tonight much too far from our subject, so I only mention it.

I have just said severe cervical tears are usually caused by bungling operation; of course, a precipitate labor will do serious damage and if the physician is present, etherization of the patient will minimize this danger. Another very common cause of serious cervical tears with hemorrhage, at the present time, is the indiscriminate, I might almost say criminal, use of pituitrin. This extract, powerful in its action, when it does act, is, if carefully used within certain definite limitations, a great help to physicians. But to give it before the os uteri is fully dilated and the head in the pelvis will prove sooner or later harmful in the hands of any man. I know the good results that have been obtained, the saving to the patient hours of labor and the physician many a dinner engagement. But the bad results—the ruptured uteri, the bad cervical tears, to say nothing of the severe perineal tears, the dead babies—are these reported as fully and carefully as when pituitrin is given and all goes well? The bad results do occur, in spite of what many physicians say.

The bleeding from lacerations is not always external, for not very infrequently do we see a haematoma of the vagina as a result of laceration of the pelvic walls and the bleeding takes place beneath the fascia.

These are the traumatic types of hemorrhage and they are all distinguished from uterine hemorrhage by the condition and action of the uterus. The outpouring of blood that may come in a true uterine post partum hemorrhage is unbelievable until one has been so unfortunate as to have seen it. The causes are multiple and many of them are definitely controllable by intelligent foresight. Anything which interferes with the normal mechanism of labor is the underlying factor in a post-partum hemorrhage.

A tumor body may interfere with the normal mechanism of labor. A hemorrhage following this complication is not the physician's fault but it is due the patient that the physician have the foresight to meet this emergency promptly and effectively.

A slow, prolonged inefficient labor either from primary inertia of the uterus or from an overdistended uterus, as with a big baby, multiple pregnancy, or hydramnios, is a common cause of bleeding. Precipitate labor I have already mentioned, for it allows uterine hemorrhage to occur as the normal retraction and contraction of the uterus is interfered with.

I believe that the true atonic uterine hemorrhage is very rare, and when an analysis of the conditions surrounding the labor is made, some abnormal mechanism will almost always be found.

The most usual cause of post-partum hemorrhage is an abnormal third stage. The abnormal point usually is in the way the physician hurries this stage. If there is no bleeding, if the fundus contracts, if the patient's pulse drops, there is absolutely no indication to hurry the separation of the placenta. If there is no bleeding and there is no internal concealed hemorrhage going on, the placenta has not separated, the fundus needs only to be held. If there is bleeding, another problem arises and the placenta then must be expressed; but if no bleeding, do not hurry the placenta. A half-hour wait or six contractions of the uterus and then the fundus Credéed, whether the placenta has separated or not, is all wrong. As soon as it separates, then express it if you wish, for nothing is gained by waiting. Another cause of post-partum hemorrhage is that many physicians fail to inspect the membranes and placenta. If the membranes are lacking, or only a part lacking, I never go after them unless the uterus shows signs of inefficient retraction and therefore a tendency to bleed. If the placenta is not complete, especially if a placenta succenturiata is diagnosed, then the interior of the uterus should be explored under the strictest aseptic precautions and the piece removed, when the sinuses will close and hemorrhage cease. A piece of retained placenta gives rise to the so-called secondary post-partum hemorrhage or puerperal hemorrhage, which I will speak of in a moment.

The first and most important point in the treatment of this condition is to prevent it, and that can be done if the patients are watched carefully during their labor, and labor is not allowed to go on without progress being made. Do not allow the uterus to act badly,—to fail to relax, without the necessary and indicated treatment to be begun. Never fail on any obstetric case to be prepared to meet a post-partum hemorrhage. Diagnose at once where the bleeding comes from and act accordingly. As soon as the uterus is emptied, then, if bleeding persists, give the patient pituitrin, ergot and put ice to the fundus. Remember, if pituitrin alone is given, not infrequently a relaxation of the uterus follows and further bleeding may take place.

Personally, I seldom use an intrauterine douche to stop a hemorrhage. If massage, careful holding of the uterus, combined with ice and ergot, will not stop the bleeding, I at once pack the uterus with sterile gauze; and in packing, always carry the gauze to the fundus with the one hand, while the other gives counter pressure over it. Do not pack in too much but, on the other hand, never fail to place the gauze in all parts of the uterus. I have seen two or three hemorrhages which were so severe that the only way I could stop them was to thrust my hand into the vagina, surround the cervix with my fingers and with the other hand on the fundus sharply anteflex it against the symphysis.

If the uterus is packed, then counter pressure should be maintained for some time until it is clear that no relaxation and bleeding behind the pack is going on. Stimulation and the giving of salt solution is, of course, used as is indicated.

A few words about the secondary post-partum hemorrhage. It practically always is caused by the retention of pieces of placenta. A case that I recently saw will illustrate this type of bleeding best. The patient was delivered by low forceps and after the delivery bled very profusely. The placenta was expressed, but she continued to bleed more than the attending physician liked, but he did not think it necessary to pack the uterus. She made an uncomplicated recovery save for the fact that red lochia persisted quite profuse, longer than usual, and the uterus was slow in involuting. She went home in three weeks but continued to have considerable red lochia. After she was at home for one week, she was seized with sudden severe pain low down in the abdomen which doubled her up and at once had a sudden and profuse hemorrhage. Her physician at once took her to the hospital. When he telephoned me he said he thought he had a tear between the bladder and the uterus. I saw the patient two days after the hemorrhage. Her temperature was normal and pulse 100. She was markedly anaemic, mucous membranes very pale. Palpation of abdomen negative save for the fact that the fundus was one finger breadth above the symphysis. It was soft but not tender. Pressure over the fundus caused slight flowing of a dirty, foul-smelling discharge. She was put across the bed for a vaginal examination and a bivalve speculum exposed the cervix,—protruding from the cervix was a mass the size of a hen's egg, dark red in color, oozing blood. The anterior vaginal wall was normal and I could see no tear as the physician feared. What he took to be a tear was the cleft between the anterior lip of the cervix and this mass. The diagnosis of retained piece of placenta which the uterus was trying to expel was clear. I decided to etherize the patient and clean out the uterus with the finger and gauze. When etherized, palpation of this mass showed it to run to the fundus of the uterus, and by quickly freeing it at the base it was removed without serious bleeding. She was given ergot and the uterus contracted at once very hard. She made an uncomplicated convalescence and in a week went home with the uterus well involuted and with no lochia. In this case the physician undoubtedly failed to observe a placenta succenturiata. This patient lost much blood unnecessarily but her ultimate recovery was satisfactory. Another case, the counterpart to this one, had a different outcome; here the uterus went septic and she ran a complicated septic chart with a double phlebitis and was sick for some months, all because of a placenta succenturiata.

Such, then, are the various points to be considered in these three kinds of hemorrhage. Remember, all bleeding in a pregnant woman is serious, never to be lightly regarded, for if we do, a desperate condition may very quickly develop and we have only ourselves, if we are willing to face the outlook honestly, to blame.

CHRONIC VALVULAR HEART DISEASE IN PREGNANCY AND LABOR.

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I.

THIS paper is a study of chronic valvular heart disease complicating pregnancy and labor. The total material from which this study is made is roughly 30,000 cases as follows: 7,200 pregnant women observed in the Prenatal Clinic at the Boston Lying-in Hospital from May, 1911, to July, 1915, and 22,055 pregnant women entering the Boston Lying-in Hospital for delivery or care in pregnancy from January, 1873, to June, 1915.

Acute endocarditis, myocarditis without demonstrable valvular lesions and congenital heart cases are not considered. Cardiorenal cases, i. e., chronic nephritis with secondary cardiac changes, or chronic valvular cases with secondary chronic kidney, have been ruled out because they present an entirely different problem and show entirely different results. Acute toxaemia of pregnancy coming on top of chronic valvular disease is considered as a complication of the pregnancy and cardiac disease, and such cases are therefore retained.

This material, however, is available for study only within the limits of its accuracy of observation and record, and it is with this limitation in mind that the arbitrary division of material for study of different types of chronic valvular disease and pregnancy is made. To illustrate: it is not accurate to estimate the percentage incidence of *compensated* cardiacs from the house records because there is evidence to show that many such cases were not recorded; it is accurate to estimate the percentage incidence of *decompensated* cases because symptoms presented which the observer recorded. This being the fact, the 7,200 Prenatal Clinic cases in which observation and record have been, on the whole, good, and in which cardiac defects are, as a rule, checked up by medical consultation, will be used for a general study of the subject, especially of compensated cardiac disease, while the 22,000 hospital cases will be used for a study of decompensated cardiac disease only.

Of 7,200 pregnant women observed in the Prenatal Clinic, 113 had chronic endocarditis, 1.5%, 1 woman in every 75.

Functional murmurs are reported 411 times, 5%, 1 woman in every 20.

The lesions in the chronic endocarditis cases follow:—

Mitral insufficiency	52
Double mitral	44
Mitral stenosis	10
Mitral insufficiency and aortic disease	3
Double mitral and aortic disease	2
Aortic disease	2
	113

The diagnosis of cardiac disease as opposed to merely functional murmur is based on signs being present other than the murmur itself sufficient to make the observer believe that the case was a true cardiac lesion, or on medical consultation.

Of these 113 cases, 11 failed to return, reducing the number for further study to 102.

Of these 102 cases, 83 showed no sign of decompensation while under the care of the Prenatal Clinic or in labor or the puerperium, 19 cases showed decompensation in greater or less degree.

Decompensation may be divided somewhat arbitrarily for the purpose of classification into first and second degree,—first degree decompensation includes those signs which may occur in the course of pregnancy without the heart as a cause, but which, in the presence of heart lesions, point to the heart as, at least, contributory to the signs, namely, insomnia, nervousness and depression, slight, dry cough, dyspnea, edema of feet and ankles, rapid pulse; second degree decompensation includes cases showing the classic signs of frank cardiac decompensation, namely, marked dyspnea, cyanosis, liver, kidney and lung congestion, cardiac dilatation, intermittent pulse, fluid in the body cavities, etc.

Using these arbitrary divisions:—

9	showed 1° decompensation
10	showed 2° decompensation
83	remained compensated
102	

Of 9 cases showing 1° decompensation, 2 were simple mitral insufficiency, 7 showed stenosis.

Of 10 cases showing 2° decompensation 1 was mitral insufficiency, 9 showed stenosis. Of all cases showing decompensation, 3 were simple mitral insufficiency, 16 were stenosis. This illustrates, I believe, the fact that stenosis cases are much likelier to show decompensation in pregnancy than cases of simple insufficiency. The maternal mortality in these 102 cases was 2. One died of general peritonitis (demonstrated at autopsy with streptococcus in the fluid) following dilatation with the Voorhees bag and breech extraction, after coming through labor well. The other died of cardiac failure in the fifth month of pregnancy following an instrumental and manual dilatation and delivery.

The maternal mortality of the whole Prenatal Clinic series of 102 cases is 2%. None of the patients died who did not show prior to delivery a 2° decompensation, while the mortality on cases which showed a 2° decompensation prior to delivery was 20%.

One hundred and five babies were born in 102 labors; 10 babies died in 8 labors, the fetal mortality was therefore 10% for the series, 2% for compensated cases, 22% in cases with 1° decompensation, and 40% in cases with 2° decompensation.

These figures, I believe, illustrate clearly that cardiac disease in pregnancy is potentially a very serious condition for mother and child and that the handling of these cases requires the utmost attention and skill.

In the whole series, 85 cases delivered themselves, 28 cases had some form of operative procedure. In the cases showing 1° decompensation, 7 cases delivered themselves, 2 were delivered operatively. In the series of cases showing 2° decompensation, 2 delivered themselves normally, 8 were delivered by operation.

These figures well illustrate the fact that many cardiacs, compensated and with only slight degrees of decompensation, will safely deliver themselves if allowed to. Because this fact is undeniably true, is no reason why we should allow them to, especially as we have little data at hand yet, from which we may judge how much a normal second stage takes out of a heart with a valve lesion.

We will now consider the decompensated cases occurring in the 22,055 house patients. All compensated cases are omitted in this consideration. 63 showed decompensation in some stage of pregnancy or labor while in the hospital, about the same ratio of decompensated cardiacs to patients observed as in the Prenatal Series. Of these 63 women, however, 20 had 1° decompensation, 43 had 2° decompensation, whereas, in the Prenatal Series, 9 had 1° decompensation and 10 had 2° decompensation I believe from these comparative figures that the Prenatal Clinic is of value in the care of cardiac disease. Prior to the days of the Prenatal Clinic, the hospital failed to care for a certain definite percentage of 1° decompensated cardiacs and some of these became 2° by neglect and entered the hospital, or were cared for elsewhere as such.

Of the 63 cases showing decompensation, 11 recovered under medical treatment and did not show further decompensation in pregnancy, labor or the puerperium.

A minute analysis of these cases is tabulated below. This table offers examples of what medical treatment will do for certain cases.

Para.	Case	Number	Lesion	Class of Decomp.	Method of Delivery at Term
1	195	195	Mitral Insuff.	1°	Breech Extraction
12	194	141	Double Mitral	2°	Bag, High Forceps
2	180	105	Double Mitral	2° slight	Low Forceps
5	168	90	Double Mitral	2°	Normal Delivery
7	164	96	Double Mitral	2°	Bag and Version
3	165	68	Mitral Insuff.	1°	Pack, Bag and Version
6	162	2	Mitral Sten. and Aortic Disease	2° slight	Normal Delivery
1	162	145	Double Mitral	2°	Normal Delivery
2	156	162	Double Mitral	1°	Bag and Version
2	201	233	Double Mitral	1°	Normal Delivery
5	204	5	Mitral Insuff.	1°	Normal Delivery

To summarize this table: 4 cases of severe 2° decompensation, 2 cases of slight 2° decompensation, 5 cases of 1° decompensation were relieved by medical treatment so that they went to term and withstood delivery of all kinds without maternal mortality. On the other hand, 10 cases, treated medically during pregnancy in the hospital, failed to be relieved or were temporarily relieved and decompensated in labor. Of this series treated medically in the hospital before labor, consisting of 21 cases, 50%, went through the remainder of pregnancy, labor and the puerperium without decompensation; 50% failed to respond through labor.

I believe, from this table, that it is fair to conclude that half the cases *not under good* *previous care for their heart condition,* which show decompensation, will recover sufficiently under treatment so that they do not again decompensate and so that they will stand any appropriate method of delivery at term.

51 cases showed decompensation in labor. Of these 51 cases, 15 died. Of these 51 cases, 16 had 1° decompensation, 35 had 2° decompensation. The lesion, degree of decompensation, the cause of death are tabulated below:

Case Number	Lesion	Degree of Decomp.	Cause of Death
1	Mitral Stenosis	2°	d. 9th day sepsis or T. B. (?)
2	Mitral Insuff.	2°	d. peritonitis following uterine sepsis. 8 h. 2d stage.
3	Not stated	2°	d. ev. of del. of acute dilatation.
5	Mitral Stenosis	2°	d. day after delivery of acute dilatation.
8	Double Mitral	2°	d. several days after entrance of pneumonia.
10	Double Mitral	2°	d. on table of acute dilatation.
15	Double Mitral	2°	d. on table of acute dilatation before delivery.
17	Double Mitral and Aortic	2°	d. day following delivery, had pneumonia in labor.
18	Double Mitral	2°	d. on table as baby delivered of acute dilatation.
24	Double Mitral and Aortic	1°	d. 8th day of cardiac failure.
25	Double Mitral	1°	d. day of operation of eclampsia; 1 convulsion.
34	Double Mitral	2°	d. on table of cardiac failure before delivery of baby.
36	Mitral Sten. (?) Insuff.	2°	d. of cardiac failure directly after delivery.
47	Double Mitral	2°	d. 7th, pneumonia following aspiration.
51	Double Mitral	2°	d. 8th, of streptococcus peritonitis.

The maternal mortality of cases showing 1° and 2° decompensation, was 33%, while the maternal mortality of cases showing 1° decompensation was 12%, and the maternal mortality of cases showing 2° decompensation was 45%. In the fatal cases mitral stenosis was present in 14 or 15 cases, the single case having simple mitral insufficiency, who died, was allowed an eight-hour second stage. I believe these figures emphasize that heart disease in pregnancy is a very serious condition in spite of the fact that many cases come through well and that the degree of risk to a mitral stenosis is enormously greater than to a single mitral insufficiency.

The method of delivery, parity, period in pregnancy and class of decompensation is next tabulated in the 15 cases that died.

Number Case	Method of Delivery	Period of Pregnancy	Para.	De-comp.
1	Normal Delivery	Term	2	2°
2	Normal Delivery	Term	1	2°
3	Version, Forceps, A. C. Head	Term	1	2°
5	Normal Delivery	Term	1	2°
8	Low Forceps	Term	5	2°
10	Instrumental and Manual Dilatation	4 mos.	5	2°
15	Died before Delivery	7 mos.	6	2°
17	Low Forceps	Term	2	2°
18	Instrumental and Manual Dilatation and Version	Term	10	2°
24	Normal Delivery	Term	5	1°
25	Instrumental and Manual Dilatation and Version	6½ mos.	1	1°
34	Instrumental and Manual Dilatation and Version	5 mos.	1	2°
36	Normal Delivery	6 mos.	1	2°
47	Normal Delivery	8 mos.	5	2°
51	Bag, Breech Extraction	Term	13	2°

Certain facts stand out in the study of these two tables. Of 15 deaths, 8 were due to acute dilatation alone, while 7 died of conditions toward the development of which the cardiac disease was, in all probability, a large contributing factor as well as a large contributing factor in the fatal outcome, namely, 3 pneumonias, 3 sepses and 1 eclampsia. I believe, therefore, that cardiac cases, especially those with decompensation, possess a markedly lowered resistance to infection, both uterine and lung.

Concerning methods of delivery and time of delivery, we find in this mortality table (1) a striking number of normal deliveries at term, (2) a striking number of instrumental and manual dilatations (*accouchement forcé* truly). Of fifteen cases that died, one of which died undelivered, reducing the number operated or delivered normally to 14, 6 were normal deliveries and 4 were true *accouchement forcé,* together 10 of 14 deaths. For comparison we may summarize the methods of delivery in the 36 decompensated cases who recovered. Of the 36 cases with cardiac decompensation who recovered, 30 had mitral stenosis (24 with insufficiency) as against 6 with simple insufficiency. 12 were 1° decompensated, 24 were 2° decompensated. Since in the cases that died we are chiefly concerned with 2° decompensated cases, we will consider methods of delivery for comparison in the cases who recovered only in those with 2° decompensation.

We find of the 24 cases with 2° decompensation who recovered, 5 normal deliveries, 3 *accouchements forcés* as opposed in the series of 15 cases who died, 6 normal deliveries and 4 *accouchements forcés.* I believe, therefore, that normal delivery and *accouchement forcé* have no place in the treatment of decompensated cardiacs of whatever degree, but especially of those with severe decompensation.

Conversely, from the above facts I believe that it is better to assist nature in decompensated cardiacs when the cervix is dilated or nearly dilated, that they stand operative delivery—barring instrumental or manual dilatation

—better than normal delivery; the exception being a decompensated multipara seen for the first time in the second stage of labor making rapid progress.

Regarding the time of delivery in the series who died, 9 of 14 were at term. It seems fair to state that if 9 cases went to term and died, some of them could have been saved by earlier interference if it had been possible to get the patient sooner. I believe, therefore, that Prenatal Clinic care, by which we mean seeing the patient once a week or oftener if necessary during pregnancy, is an absolute necessity in the care of cardiacs. The fetal mortality in cases dying is 5, all were premature, 33% of the maternal deaths. If the maternal death rate were lower, the fetal mortality would be higher. The fetal mortality of the whole series, exclusive of those cases decompensated at some period in pregnancy but not in labor, is 14; 12 were premature, 2 stillbirths; 23% of the infants of cases showing decompensation in labor died. The fetal mortality in cases showing decompensation and recovery was 19%. In view of these figures and of the preceding facts, I believe that it is not justifiable to attempt to carry a decompensated case along to term for the sake of her baby unless she reacts favorably to treatment almost immediately. The fetal mortality in these cases is so high that it is not good judgment to over-risk the mother for the sake of the child. Circumstances, especially the question of whether the woman has other living children, will obviously affect our judgment in a given case.

Of the 15 cases that died, 9 were multiparae, 6 were primiparae. If the 9 women who died had not repeated their pregnancies they would have lived longer. It is unfortunately not possible to trace back their previous confinement histories except in two or three instances, but I think on the evidence it is fair to state that a woman with mitral stenosis, with or without insufficiency, is wise to abstain from further pregnancies even though she passes through one confinement without decompensation. If she decompensates in one pregnancy there can be no question in the matter,—she must be ordered not to repeat.

II.

We will now consider the literature of recent years (the last three) to see what this offers in helping clear the problem in hand.

Twenty titles present themselves for consideration; we will consider only the more significant. (All constitute the appended bibliography.)

In 1912 F. S. Newell[1] summarized the general knowledge of chronic endocarditis in pregnancy. He states that although the heart does not normally hypertrophy (Stengel and Stanton) there is evidence to show that pregnancy does add work to the heart (McKenzie). He points out that the condition of the myocardium cannot be gauged in a given instance by even the most expert internist, and that a guarded prognosis should be given in any cardiac case complicating pregnancy. He suggests Caesarean section as a method of delivery for consideration in primiparae. His conclusions follow:—

1. Any organic heart lesion, even if perfectly compensated under normal conditions, should arouse apprehension and call for constant watchfulness if pregnancy supervenes.

2. In case pregnancy comes as a complication when the heart is imperfectly compensated, the uterus should be immediately emptied, since a heart which has failed under the ordinary burdens of life has no chance of sustaining the added burden of pregnancy.

3. When a heart which has been previously well compensated fails during pregnancy, an attempt must be made to restore compensation by rest and appropriate treatment, but unless the attempt is promptly successful the pregnancy should be ended.

4. If compensation has failed during one pregnancy, future pregnancies should be absolutely forbidden.

5. In any case in which an organic heart lesion can be demonstrated, even though it may have caused no symptoms during pregnancy, labor should be regarded with apprehension, and every measure should be taken to shorten the labor and thus relieve the heart of a serious burden although it may seem to be doing its work perfectly well.

6. A patient with an organic heart lesion will usually stand an operation well if the operation is performed at a time previous to a failure in compensation. On the other hand, an operation after failure of compensation will often prove fatal in patients who would have stood operation well at an earlier time.

7. Any patient known to have an organic heart lesion who is contemplating marriage should be advised of the dangers pertaining to pregnancy and labor, the prognosis in the individual case depending on the nature of the lesion, the age of the patient and her previous history as regards the efficiency of the heart under normal conditions.

8. It is impossible to estimate accurately the efficiency of the cardiac muscle in any patient in whom a failure of compensation has once occurred, since although compensation may have been promptly restored under treatment, she may die suddenly before, during or after labor, without warning.

9. Labor should be shortened as much as possible in every patient who has a demonstrable heart lesion, although no unfavorable symptoms may have risen. In primiparae the propriety of a Caesarean section to relieve the heart of the strain of labor may be very properly considered in any case, particularly if the soft parts are rigid, since it is poor policy to

test the endurance of a given heart unnecessarily.

10. The demonstration of a mitral stenosis should call for the most careful observation. Any sign of failing compensation should be met promptly, and if any condition supervenes which is accompanied by a rise in arterial tension, the pregnancy should be terminated at once.

Pankow[2], 1913, reports an incidence of 2.8% of heart disease in over 5,000 pregnant women examined by internist in Freiburg and Dusseldorf. Functional murmurs occurred in 50%. He says that mitral stenosis has the most serious prognosis because it adds a large amount of work to the small blood circulation and therefore more easily brings about a decompensation, also that a mitral stenosis labors from its beginning with the small reserve force of the right ventricle, as opposed to the large reserve force of the left ventricle in mitral insufficiency. He gives the following general indications for the artificial interruption of pregnancy.

1. If a woman suffering from organic heart disease becomes pregnant and if signs of insufficiency of the heart do not appear in the course of pregnancy, then pregnancy should not be interrupted, as in all probability complications are not to be expected intrapartum. (2). If signs of insufficiency of the heart appear even during the first half of pregnancy, showing that the slight increase in the work of the heart already exhausts the reserve force, then pregnancy should be interrupted in all kinds of heart disease, as the increased work placed on the heart towards the end of pregnancy and during labor may lead to a sudden failure of the heart. This applies especially to those cases in which the signs of decompensation existed before the occurrence of pregnancy. (3). If signs of decompensation appear towards the end of pregnancy, then the latter must be interrupted in mitral stenosis, especially if marked signs of a severe myocardial disease are present. The treatment is expectant in mitral insufficiency if signs of decompensation permanently disappear after a corresponding treatment. If the signs of decompensation continue to exist, or if they immediately recur after interruption of the treatment, then it is preferable to interrupt the pregnancy through vaginal section, considering the increase in the amount of work on the heart by labor. The frequent complication of mitral stenosis and insufficiency may render the procedure considerably difficult. (4). If signs of decompensation appear during labor then treatment should be expectant if labor is apparently almost terminating, otherwise labor should be cut short by extraction of the child.

Gröne,[3] 1913, reported the material from Malmo; 87.5% remained compensated. 1.1% of pregnant women showed heart disease. 2.6% was the total mortality. He states that the mortality from available literature is only 1.2%. He states that profound ether narcosis has no effect on decompensated heart cases. He advises leaving the case to nature until obvious signs call for interference. He believes the liability to miscarriage and premature labor over-estimated in heart disease.

Fromme,[4] 1913, states that blood pressure increases in the second half of pregnancy and can reach values above the limit of normal. In labor there occurs great variation in pressure independent of the individual labor phase. So the heart must be supposed to do increased work in pregnancy (especially second half) and labor. He believes that sterilization for cardiac disease should be done only when the uterus is emptied for decompensation. He believes that patients over forty have a more serious prognosis and agrees with Kustner that the after-life is shortened, and he warns that if a patient does not soon respond to medical treatment, she should be treated surgically without delay. 75 to 80% of cardiacs show nothing in the passage through pregnancy. He states that stenosis with or without insufficiency occurs in 28% of all mitral cases, but that the death rate is 75% in stenosis cases.

Kreiss[5 6], 1913, reports two deaths in interruptions of pregnancy for heart conditions in 23,577 labors; he advises classical Caesarean section as against vaginal hysterectomy on account of the danger of hemorrhage in severe congestion. He states that heart disease is only rarely made worse by pregnancy.

Baisch[7], 1913, in "Researches Concerning the After Life of Pregnancies Complicated by Heart Disease," found in an investigation of 205 cases occurring in 21,000 births that 200 showed some decompensation, 50 serious, 5 died in labor, 3 the following year; of the controlled cases 50% were well, 45% were invalids, 5% were dead. 33% of the children were premature. 40% of patients had atonic hemorrhage.

Webster[8], 1913, says: "As regards pregnancy, women with heart disease should not become pregnant. If pregnancy occurs it is on the side of safety to advise early abortion, especially if there has been recent acute disease of any variety, or old mitral disease with failure in compensation.

With reference to labor, if the patient's condition is good, the first stage should be allowed to progress, as in normal cases, all strain and excitement being avoided. It is advisable to avoid straining in the secondary stage by artificial delivery, forceps, or turning under anaesthesia. In the third stage, it is best to separate the placenta manually, allowing some loss of blood. A woman at term with failure in compensation or embarrassed circulation probably has the best chance if delivered by vaginal or abdominal Caesarean section.

Tusgkai[9], 1912, discusses prognosis and his pulse variation sign which is spoken of later.

Barris[10], 1913, discusses Caesarean section under spinal anaesthesia in cardiac cases, citing five, with the following conclusions:

1. It must be admitted that some cases of cardiac disease pass through labor unexpectedly well apart from this treatment.
2. On the other hand, the method has the merit of great rapidity and of relieving the cardiac muscle of strain during the first and second stages of labor, thus diminishing the risks both of cardiac failure and of embolism.
3. Sterilization may be carried out at the same time.
4. There is no predisposition to uterine inertia, especially where pituitary extract is given immediately before making the abdominal incision.
5. The child appears to run no risk from asphyxia, crying at once after extraction.
6. No undue amount of shock was observed in the cases recorded.
7. The mental effect upon the patient is a possible drawback to the method. This may be minimized by administering morphia or scopolamine before the operation and by cocainizing the skin prior to the injection of the spinal anaesthetic.

Eisenbach[11], 1913, found 45 cases of heart disease in 3,037 deliveries. He believes that the kind of heart lesion has no special effect; there is even no particularly unfavorable effect from mitral stenosis. Otherwise, he takes an extremely complacent view of the matter.

Pellissier[12], 1915, studying the pressure curves and viscosity of the blood in the heart cases in pregnancy, finds slight or well compensated valvular lesions do not materially affect either pressure or viscosity. In women with heart disease, especially of the mitral valve, involvement of the myocardium is indicated by irregularity in the pressure curve, lowering of the maximum pressure, and increase in the minimum. There is increase in the viscosity in these cases as soon as the lesser circulation begins to suffer.

Polack[13], 1915, states twilight sleep state is a reality, it is particularly useful in cardiac cases as it relieves the nervous apprehension and secures dilatation with less muscular shock. It is distinctly a first stage procedure, it relieves the pain, but does not inhibit the progress of labor.

J. L. Huntington[14], 1915, considers that heart disease in pregnancy is a neglected subject in text books and the literature. He advises the careful following of the case through pregnancy and discusses methods of delivery,—favoring operative delivery at full dilatation in multiparae, rejecting normal delivery except in precipitate labor; discussing abdominal Caesarean section for primiparae, pointing out the danger and frequency of distention following this procedure, but concluding that in spite of this it may in individual cases offer the best solution. He fears "the risk of prolonged first stage in primiparae, wth its inevitable strain on the heart as shown by the rising pulse so common with the normal heart in first stage, and feels that only when the patient is very young and strong, the cervix soft and the lesion not extensive, should this method be chosen." In conclusion, he feels that "where the cardiac condition requires that the uterus must be emptied several weeks before term, vaginal hysterotomy, when not rendered impossible by the anatomical limitations, offers distinct advantages over abdominal Caesarean, particularly because in the former operation there is no post-operative distention."

C. H. Lawrence[15], 1915, in a paper entitled "Failing Cardiac Compensation During Pregnancy," takes up the question from the medical point of view. We shall quote extensively from this paper.

So much then for the statistical study of heart cases, and for the study of the recent literature; the remainder of the paper is an attempt to correlate the information here derived and a statement of the author's views on the obstetrical handling of chronic valvular disease in pregnancy and labor.

III.

It is necessary first, in considering chronic valvular heart disease complicating pregnancy and labor, to differentiate clearly what we know from what we think we know.

We know from our statistics and others with which they fairly well correspond that 1 woman in about 75 who becomes pregnant has chronic endocarditis; that 1 pregnant woman in every 400 has broken compensation, that 1 pregnant woman in every 1,700 pregnant women dies with decompensated valvular heart disease as the direct or indirect cause. We know further that 1 woman in about 5, having chronic valvular heart disease in pregnancy, will show broken compensation in some degree during pregnancy or labor, 1 in 10 in severe degree. We know that if a woman has decompensated without pregnancy she will probably decompensate more severely if she becomes pregnant. We know that if she has not decompensated before pregnancy, she stands about a 4-1 chance of going through pregnancy entirely free from decompensation. We know that if she has stenosis of the mitral valve, her risk is greater, that if she has pure insufficiency it is extremely slight. We know that if she decompensates in pregnancy, *living a normal life*, she has a 50-50 chance of recovery under medical treatment and routine, and going to term without further trouble. We know that if a patient fails to react to medical treatment for severe cardiac decompensation that her percentage of danger is very high, higher probably than with any other complication of pregnancy except cancer or advanced phthisis. We know the fetal mortality in the above classes, we know the percentage risk of death if she decompensates 1° or 2° prior to or in labor; the fetal mortality gives us a chance to balance possible reward for risk taken. We are in a position, then, to state the risk whether the opportunity arises before or after pregnancy has taken place. The decision in the matter is then up to the patient and her husband. The individual obstetrician may not be willing to terminate labor in a given case, but as long as Lusk's statement holds, that the diagnosis of mitral stenosis calls for an immediate abortion, somebody can be found who will do it, if the patient so elects; just as, so long as Hirst makes the statement that, with proper treatment, he has no fear of heart disease as a complication of pregnancy, someone can be found who will try to take a cardiac through labor who wishes to try to go through, on whom the first seen obstetrician would do an immediate therapeutic abortion. The question of a cardiac getting pregnant or remaining so, if pregnant, depends on the cardiac's wish when in possession of these facts.

We know that we do not know what any given heart will do in pregnancy or labor until it has done it. We have seen a completely decompensated cardiac survive two eclamptic convulsions and an *accouchement forcé;* we have been told by first-rate internists that this woman will stand delivery,—and she dies on the table; we have been told that this woman seen at the fourth month by a competent internist will go through pregnancy well; she is on edge from the fifth month on, gets acute dilatation in labor, has a severe post-partum hemorrhage which first saves her life and then threatens to kill her; has the uterus packed; we are told she will die; she lives to go moderately septic; she does not die; we are told she will always be an invalid; she brings up a baby, beginning four weeks later, and six months afterward is looking after her baby, her husband and two brothers, teaching three classes of stammerers not to stammer; lives in a seven-room apartment which is always clean, and considers a maid unwarranted extravagance.

So much for what we know and what we do not know. Now for what we think. Apparently it is the best opinion, and it seems reasonable to suppose, that pregnancy and labor throw some added strain on the heart if it is normal. We infer fairly enough that they do on the heart with chronic endocarditis; in the majority of cases the heart with chronic endocarditis stands the strain; in some it does not. How this matter is thought of depends not on the facts, which are pretty much the same everywhere, but on the feeling of the given community and the temper of the individual obstetrician in regard to these facts. Thus we find the Continental School in the literature we have surveyed optimistic on the subject—some women die, yes, but, on the whole, results are pretty good; while the American School (with some exceptions) takes a pessimistic stand,—cardiac cases are dangerous,—we should forestall trouble. I state this obvious fact because I wish to show that the difference between the opinions of Webster, Newell and Lusk, for instance, on the one hand, and Eisenbach, Kreiss and Hirst, on the other, is not based on the difference in facts at their command, but on a temperamental difference in their ways of looking at the same facts.

Granting then, that, on the whole, it is the accepted view that a chronic valvular heart disease introduces a considerable element of added risk to pregnancy, what is on the whole the best way to handle the matter? This brings us to a more minute consideration of the opinions of the men whose papers we have broadly considered, and I am obliged to begin with a general criticism of practically all "Cardio-Pregnancy" literature which we have examined, including, I may add, all the more modern text books of obstetrics. I hesitate to make the criticism because it applies so generally. All "Cardio-Pregnancy" literature insists too much that each case must be handled individually, and then proceeds with great care not to do it. All medical problems in the individual must be handled individually, but when we are trying to learn from the work of others what their experience has taught them regarding a given medical problem or while we are trying to teach our experience to others, it is primarily necessary that we have some classification that will enable the learner to visualize the teacher's case so that he may place it side by side with his own. "Cardio-Pregnancy" literature appears to us thoroughly to lack any classification, and until some classification is made, it seems to us impossible to teach or learn much from it. Even cardiac pregnancies possess only so many variations,—a limited number. Why not, then, take them one by one and outline, with the reasons, what is thought should de done for each. Over and over again, reading the literature we wonder what the actual condition of the given patient was at the moment being discussed, and we find that there is no given patient, that we are reading a composite of generalities. Let me cite an instance, because this failure truly to individualize is the big reason why it is so hard to learn anything from others on the subject, and this in turn is why the handling of the subject is so variable. "I feel that only when the patient is very young and strong, the cervix soft, and the lesion not extensive, should this method be chosen." This sentence occurs in the midst of one of the better papers of the group considered, yet there is nothing in it or its context to tell whether the author is talking about a woman with a pulse of 120 or of 72, intermittent or regular, whether she has edema of the lungs and cyanosis or is a perfectly compensated double mitral—the words "extensive lesion" mean one thing to one, another to another, nothing very definite to either. She may be ever so young and very strong, but how can we learn from that what the author thinks he should do to her in various states of cardiac disease or what we shall do at the bedside of our patient who is very young and very strong, too, but who is also in a perfectly definite stage of cardiac compensation or decompensation. I believe this illustrates a vital loss in most of the literature of our subject from the standpoint of instruction. We must learn from work more specific.

By far the most significant papers we have looked at are those of F. S. Newell[1] and C. H. Lawrence[20]. The first has been quoted at length. I shall make use of its ideas in my exposition of the obstetrical side of the question. In C. H. Lawrence's paper, "Failing Cardiac Compensation in Pregnancy," are laid down certain principles for guiding a cardiac through pregnancy, watching to catch failing compensation early, to meet it medically prepared, to know when to interfere and how medically to handle the patient most wisely during and after interference and in the presence of cardiac emergencies. Its chief merit is that it is definite and specific, not vague and general. Various internists may disagree with the details of treatment or maintain that the emphasis should be laid more strongly on certain factors in treatment and less strongly on others than is done, but this does not detract from the great value of the paper to obstetricians because it is the single example that we have been able to find which takes up the medical side of the matter in hand with any degree of definiteness and specificity. I will therefore use quotations from it to cover briefly the medical aspects of the treatment of cardiac disease in pregnancy.

"Therefore," he says (in view of the risk that pregnancy will by itself or its complications bring about a greatly increased demand on the heart), "in estimating the ability of any heart to meet the demands of pregnancy, the margin of safety demanded must be a wide one and the estimation of cardiac compensation and reserve must be based upon thorough and painstaking examination of the circulatory apparatus and upon the understanding that the patient must be very closely watched during pregnancy and labor for signs of failing compensation." He then proceeds to detail the earlier signs of decompensation or, as he terms it, "of sub-efficient circulation" coming before the classical signs of dyspnoea, edema, tachycardia, etc. These are, briefly, periods of slight debility in the past history, insomnia, slight cough, the trial of the pulse rate as described by Tuzkai, the variations in pressure described by Schoonmaker, slight elevation in respiration, the pulse deficit.

"Given a patient who has had slight failure of compensation.....the decision must be made at this point as to whether the uterus should be emptied, and if the latter course be decided upon, it must be carried out at once......for if the physician hesitates further he is likely to encounter conditions which make waiting and interference alike hazardous. If the patient has had a previous break or several periods of sub-efficiency it is the writer's belief that pregnancy should be allowed to continue for one reason only,—that the patient, in full knowledge of the risk she runs, refuses to forego the chance of bearing a child."

He concludes: "pregnancy and imperfect cardiac compensation are incompatibles and their co-existence constitutes always a grave menace to the patient. One or the other must be eliminated, either good compensation must be maintainable under ambulatory conditions or pregnancy must be terminated. And if the patient's life is to be saved, the decision must be reached before the latter method of settling the question becomes too hazardous."

So much for the medical side of the matter, which we consider should always be handled by an internist, one, if possible, whose experience with cardiacs in pregnancy is extensive.

It should be borne in mind, and it will be constantly reiterated, that every case under consideration in the following pages has been raised by medical treatment to its highest point of circulatory efficiency. This is not impracticable, because if we leave out the rare cases of sudden death which occur in cardiac disease, there never was a case of valvular disease complicating pregnancy, whose circulatory efficiency was not proved by rest and medical treatment, unless the case was moribund. Many cases that have not been properly watched and treated, seen apparently dying, have been saved, temporarily at least, by proper medical treatment; whereas many cases moribund have been killed by immediate operation before venesection and appropriate medical treatment have improved the condition enough to make delivery somewhat safe. But there comes a time in the treatment of every decompensated cardiac when her circulatory efficiency has been raised to a point where she is either fit to continue her pregnancy or where she must be forthwith delivered, because she is now at her high point as an operative risk. If she belongs in the former class, her care remains medical; if in the latter, obstetrical, and it is this latter class I now wish to consider. How, then, shall we deliver patients with cardiac disease, not in labor, when in our opinion or the opinion of the medical consultant they should be delivered?

Certain factors in the patient's condition determine what method of delivery should be selected. These factors are:

1. Period of Pregnancy.
2. Degree of Sub-efficient Circulation or Decompensation.
3. Parity or more truly the Condition of the Cervix.

Regarding the third of these conditions, we will use the terms primipara and multipara, it being understood that these terms refer not necessarily to the number of babies the patient has had, but to the character of her cervix.

The 1° and 2° decompensation have been defined earlier in this paper; the term sub-efficient circulation means simply that the given case has come back from a 1° or 2° decompensation under medical treatment, but that the internist feels she must, nevertheless, be now delivered, because she will not stand the remainder of her pregnancy and because he feels to chance another break would jeopardize her too much.

There are at our command the following procedures when we must deliver a cardiac before labor has begun:

1. Normal Delivery after Induction with Voorhees Bag or Pack or Bougie.
2. Instrumental and Manual Dilatation and Extraction.
3. Dilatation and Curettage at One Sitting.
4. Vaginal Hysterotomy.
5. Voorhees Bag, Version and Perforation and Extraction.
6. Abdominal Caesarean Section.
7. Bag, Forceps at Full or Nearly Full Dilatation.

I believe the facts we should consider with regard to these procedures are as follows: Normal delivery is, statistically as well as theoretically, a bad procedure in cardiacs which are decompensated in any degree or which have decompensated and have become compensated under treatment. We have shown that the mortality series showed a much higher number of normal deliveries than the series that recovered. Instrumental and manual dilatation and extraction is also, according to the statistics, a bad procedure in cardiacs because of shock.

I believe, therefore, that normal delivery and instrumental and manual dilatation may be ruled out of consideration in this connection.

Dilatation and curettage, emptying the uterus at one sitting under morphine anesthesia with ether added when necessary, is, I believe, the method of choice in the first three months on all cardiacs requiring therapeutic abortion at this time. The two points arising at this period of pregnancy are question of method and question of anesthesia. The slight shock of dilating the cervix in these months sufficiently to extract the ovum is overbalanced by the longer time and the labor required to empty the uterus, and the somewhat added risk of infection in patients known to have lowered resistance, by slow induction, by pack, bag or bougie, though it is fair to say that an unusually tough cervix, especially if the patient is in the third month, will render it better judgment to resort to the slower methods in primipara with sub-efficient circulation or 1° decompensation or to vaginal hysterotomy in a primipara with 2° decompensation.

Regarding anesthesia, the author regrets lack of experience with spinal, but feels it worthy of much consideration in 2° decompensated cases in the first three months, but feels its inherent risk too great to justify its use at this time in cases with sub-sufficient circulation or 1° decompensation. Omitting this from further consideration, morphia and ether are the two anesthetics of choice in all cardiac cases. What can be done under morphia without getting a reaction which may be expected to work circulatory harm, should be done; when this reaction is attained, ether should be added. Cardiacs in all stages of decompensation stand ether, properly given, well, as a rule. Pneumonia, however, is, as we have seen statistically, a grave and not infrequent complication of this condition, and it must be supposed that ether somewhat increases the danger of this complication. This and the excitement stage, which should always be controlled by morphia, are the two real ether dangers. Much morphia, little ether should be the rule when the viability of the child is not in question, together with an even, carefully administered anesthesia. When available, oxygen should be used in combination with the ether; this may be handily done in a Flagg nitrous-oxide-oxygen machine with ether attachment, and respiratory difficulty during the anesthesia is considerably lessened by its use.

The next method of delivery which we must consider is vaginal hysterotomy. This has its special applicability in the fourth, fifth and six months when we are still dealing only with the mother. The question resolves itself into whether patients at this time with sub-efficient circulation or 1 or 2° decompensation, primipara or multipara, will best stand two-stage delivery with some labor or a quick surgical operation. Concerning two-stage delivery, induction with pack or bag at this time, certain disadvantages confront us, as follows: (1) the patient has labor, (2) labor is apt to be prolonged from the often relative inactivity of the uterus in these months, (3) the use of a pack or bag, we believe, especially in a cardiac with known lowered resistance to infection, offers a real, though slight, added risk of infection, (4) on top of which manual extraction of the fetus and more often of the placenta, is very frequently necessary in these months, adding invasion of a less resistant uterus through a previously bagged vagina to the danger. We believe these risks are not great, but that they exist and must be considered. Vaginal hysterotomy is usually easy of accomplishment in these months if the cervix will pull down. It takes from 25 to 45 minutes, it is very free from shock, it is as free from risk of infection as any surgical procedure through the vagina, it is shortened in these months by perforation of the non-viable fetus. Its disadvantages are that it needs plenty of hands and good light, that it is occasionally anatomically difficult or impossible that,—as certain German authors have pointed out, —if passive congestive is extreme, is prone to be accompanied by severe hemorrhages which, I feel, is not in itself dangerous to the patient, but by overbleeding her, aids to the risk of infection and, by blurring the field, renders the operation technically more difficult. I believe that vaginal hysterotomy with perforation, is the operation of choice for induction in all primiparae and multiparae during the fourth, fifth and sixth months of pregnancy with sub-efficient circulation or 1 or 2° decompensation when circumstance and adverse anatomical conditions do not prevent its ready accomplishment, with morphine-ether-oxygen anesthesia (or spinal anesthesia in patients with 2° decompensation); that the alternative is pack or bag induction—bag without the pack preferably—labor under morphine with operative interference accompanied by simple perforation when sufficient dilatation has been obtained to get the perforated head through, version being the operation of necessity.

I also believe that vaginal hysterotomy is the operation of choice in cases in the seventh and the eighth month, primipara and multipara, with 1° and 2° decompensation, and that the second choice in these cases is Voorhees bag, forceps at full or nearly full dilatation. My reasons for this choice will develop under discussion of abdominal Caesarean section which we will now take up. There are 5 distinct disadvantages to abdominal section in decompensated heart cases. (1) Huntington has pointed out that this operation is very prone to distention in general, that it is especially so in decompensated cardiacs. Lawrence states that distention, abdominal or even gastric, has more than once been sufficient to change the condition of the heart from good to fair, from fair to poor, and, though he does not state it specifically, it seems reasonable to assume from bad to cessation of function. It is true, however, that pituitrin and less intestinal preparation and not walling off the uterus, keep distention down in abdominal Caesarean section to a great extent; how true this is in cases with decompensated cardiac disease, has yet to be shown, but these facts certainly lessen the force of this argument. (2) Cardiacs have a lowered resistance to infection in general, and concealed edema in the abdomen results in an added local peritoneal loss of resistance (Lawrence). It is impossible to foretell this peritoneal edema before operation. A cardiac, especially one in 1° or 2° decompensation, runs an added risk of peritonitis; therefore if operated abdominally, this will kill her; with a pelvic infection she will probably recover. (3) A certain definite percentage of laparotomies develop acute gastric dilatation. A cardiac with decompensation would fare badly if acute gastric dilatation intervened. (4) Embolus is the unfortunate and unpreventable cause of death, increasing the mortality somewhat in almost every series of Caesarean sections. Because it is unpreventable does not alter the fact that it is much more frequent following Caesarean section than following delivery from below, and it seems to me that it is much more likely to occur in cases with venous stasis than in cases with efficient circulation. (5) With Caesarean section, the uterus is emptied more rapidly than by delivery from below, with the consequent more rapid alteration of circulation, which puts an additional strain on an already weakened myocardium.

I believe these objections carry sufficient weight to rule out abdominal Caesarean section in the seventh and eighth months in cases with 1 and 2° decompensation. In the seventh and eighth months we have two patients instead of one. Conditions are otherwise changed from the previous months. The uterus in the seventh month gets to be a better working organ, the mechanism of placental separation works better; in short, the conditions which rendered induction by the bag risky, are improved and are correspondingly less dangerous, but in the seventh and the eighth month with a primipara or multipara who has regained compensation, but has a sub-sufficient circulation and so must be delivered, we do not wish a prolonged labor, not only on the mother's account, but on the child's as well. The baby's chances at seven and eight months are much better by abdominal section than by forceps, version or normal delivery. The risks to the mother from abdominal Caesarean are slight in *compensated* cases. Vaginal hysterotomy presupposes a forceps or version with a poorer fetal prognosis. Bag induction presupposes a normal delivery or forceps or version, all with a worse fetal prognosis. I believe, therefore that abdominal Caesarean is the operation of choice in primiparae and multparae in the seventh and the eighth month, compensated with sub-efficient circulation, and that vaginal hysterotomy is the operation of choice in these months in all cases with 1 and 2° decompensation when this operation is possible by circumstance or anatomy. If this is for any reason impossible, I believe it best to induce labor with the Voorhees bag and terminate it immediately with forceps at full or nearly full dilatation.

We may now consider patients at term. Here again conditions are altered. The child being at term is capable of offering its normal resistance to operative procedures from below. This, in general, renders abdominal Caesarean a less desirable or necessary procedure from the baby's standpoint. Vaginal hysterotomy is ruled out of consideration by the danger and difficulty of extracting a full term child in this manner. This, of course, depends on the size of the child and somewhat on the given mother's pelvis, but its applicability would be the exception and we will therefore omit it from further consideration. Because abdominal Caesarean section is the safest method of delivery for the mother in cases that have decompensated and regained compensation under treatment, because such a case *should* be the woman's last chance for a baby, because abdominal section is safer for the baby than any delivery from below, and because it is fair to sterilize these patients (especially if decompensation has developed under good care), I believe abdominal Caesarean section the method of delivery of choice in primiparae and multiparae at or near term, compensated with sub-efficient circulation.

For patients at or near term with persisting 1° or 2° decompensation, two questions must be answered: (1) how much strain does the *first* stage of labor throw on a heart with decompensated valvular disease? (2) how long may we expect it to take for Voorhees bag to dilate the cervix of a cardiac at term to full or nearly full dilatation? Huntington states that the first stage of labor must cause considerable strain on the heart because the pulse usually rises through the first stage in patients with normal heart. This seems to us inadequate proof and we have not observed that it invariably occurs, but it is reasonable to suppose that due to the constantly changing circulation caused by the first-stage contractions, a certain amount of strain of accommodation is put on the heart in this stage. Statistically, however, as near as I can judge, and from my experience, cases with restored or sub-efficient circulation show little sign of this strain, and by lowering the threshold of pain appreciation and reducing physical activity with a moderate amount of morphia, and by shortening this stage with the Voorhees bag, I believe the strain is not great. Regarding the second question, statistics furnished by C. D. Reed, who has recorded the induction of 100 non-cardiac cases with the Voorhees bag, furnish us with data for an answer. He found the average length of time in his series to be three hours and twenty minutes and that it was rarely over four hours. If this is true in non-cardiacs the first stage will probably be still shorter in cardiacs. It must be said, however, that occasionally the bag does not work at all, and that having used it, Caesarean section later is practically ruled out, but we think that it is not common for the bag to fail, especially if we limit its use in cardiacs to cases with 1 and 2° decompensation which have a soft cervix from congestion. The suspicion that bags are likely to give rise to infection is not borne out by the literature available and we consider the slight risk of this, which we personally believe exists, to be of no account in comparison with the risks of other procedures in this condition. In regard to scopolamine-morphine anesthesia, as suggested by Polak's article, the author regrets lack of experience. It would be an ideal form of anesthesia for the first stage of cardiacs, at least, in theory. Some few cases of this form of anesthesia observed by the author resembled a Roman circus, therefore it is our feeling that before using this method on cardiacs the technic should be very carefully worked up on non-cardiacs. Bear in mind these considerations and those which have gone before, especially with regard to what the author considers to be the very real dangers of Caesarean section *in definitely decompensated* cardiacs, I believe, that the wisest method of delivery in primiparae and multiparae at, or near term, who have been raised to the highest point of circulatory efficiency and must be delivered, is Voorhees bag induction, normal first stage under morphine or morphine-scopolamine, ether (or spinal in the 2° decompensated cases) and extraction at full or nearly full dilatation. Whenever the Voorhees bag is used in the treatment of cardiacs as outlined, a two pound weight should be attached to the stem and sufficient dilatation should be attained to introduce the bag, which corresponds in size to the baby's head, so that but one introduction will be necessary to obtain full, or nearly full dilatation.

Two other classes of cardiac disease in pregnancy need mention.

(1) The treatment of a cardiac who has come to term without ever showing any degree of sub-efficient circulation or decompensation. The question naturally arises whether such a case shall be saved all labor by elective Caesarean section, whether she shall be permitted to deliver herself if she will do it without signs of circulatory embarrassment or whether she shall have her first stage made as easy and short as possible with immediate delivery at full or nearly full dilatation. The decision here should depend on the lesion itself, on the condition of the cervix, on the probable character of the labor as near as can be guessed, and on the relative size of the baby and the pelvis. Normal delivery in these cases in any event does not seem justifiable in view of the data here collected, even though it must be accepted as true that many of these cases will deliver themselves without apparent harm. Cases with mitral insufficiency should be delivered from below in these circumstances. Cases with pure or nearly pure mitral stenosis should be delivered by abdominal section in these cases. In the commoner double mitral lesion the decision will rest on a consideration of the cervix, the relation of the baby's head to the given pelvis and the probable character of the labor. Multiparae, then, will as a rule be delivered from below, with forceps at full dilatation, after the first stage, made as easy and short as possible. Primiparae may be given a six- or eight-hour test of labor, during which time the character of the labor and its results in progress in dilating the cervix, together with the reaction of the circulatory system to the first-stage pains, may be observed and the decision for or against abdominal section made on this basis.

(2) Cardiacs in various stages of decompensation seen for the first time in labor. I believe these cases should be treated along lines which the above statements include, namely, avoidance of normal delivery and *accouchement forcé*, shortening or preventing second stage by operative procedure, shortening and reducing pain and excitement of first stage by the Voorhees

bag and morphine or morphine and scopolamine, abdominal section early in labor in suitable cases.

The appended chart serves both as an outline of what the author considers a proper classification for the handling of decompensated heart cases in pregnancy and as a summary of his present belief as to the wisest obstetrical handling of these cases.

Choice of Method of Delivery of Cardiacs First Raised to Highest Point of Circulatory Efficiency.

	Compensated with Subefficient Circulation		Decompensated 1°		Decompensated 2°	
	*Primipara	Multipara	*Primipara	*Multipara	*Primipara	*Multipara
1st 2d 3d Months	Morphia, ether-oxygen, D. and C.	Morphia, ether-oxygen, D. and C.	Morphia, ether-oxygen, D. and C.	Morphia, ether-oxygen, D. and C.	Morphia, ether only if necessary, D. and C.	Morphia, ether only if necessary, D. and C.
4th 5th 6th Months	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag, Version Perforation	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag. Version Perforation	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag, Version Perforation	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag, Version Perforation	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag, Version Perforation	Vaginal hysterotomy Perforation A. C. Head 2d choice: Bag, Version Perforation
7th 8th Months	Abdominal Caesarean (?) sterilization	Abdominal Caesarean sterilization if living children	Vaginal hysterotomy 2d choice: Bag, Forceps at full dilatation	Vaginal hysterotomy 2d choice: Bag, Forceps at full dilatation	Vaginal hysterotomy 2d choice: Bag, Forceps at full dilatation	Vaginal hysterotomy 2d choice: Bag, Forceps at full dilatation
Term	Abdominal Caesarean (?) sterilization	Abdominal Caesarean sterilization if living children	Bag, Forceps at full or nearly full dilatation	Bag, Forceps at full or nearly full dilatation	Bag, Forceps at full or nearly full dilatation	Bag, Forceps at full or nearly full dilatation

* Applied to type of cervix.

CONCLUSIONS.

The following conclusions are drawn from this study of chronic valvular heart disease in pregnancy and labor.

1. 1-2% of pregnant woman have chronic endocarditis.

2. 15-20% show some decompensation under prenatal care, half these 1° decompensation, half 2° decompensation.

3. Cases with stenosis of the mitral valve, with or without insufficiency, are far likelier to decompensate in pregnancy than cases with simple insufficiency.

4. The maternal mortality of chronic valvular disease in pregnancy is 2%. The maternal mortality of cases showing 2° decompensation, requiring induction, and 2° decompensation in labor, is 45%.

5. Mitral stenosis is almost always present in fatal cases.

6. Fetal mortality runs from 10%, in a series including all cases, to 40% in cases with 2° decompensation.

7. Chronic valvular heart disease complicating pregnancy is, in view of these figures, potentially a very serious condition for mother and child, and the handling of these cases requires the utmost attention and skill, frequent prenatal observation being an absolute necessity in all chronic valvular cases complicating pregnancy.

8. Half of these cases *not under good previous care for their heart condition*, which show decompensation, will recover sufficiently under medical treatment, rest and the proper regulation of their lives so that they do not again decompensate, and so that they will stand any appropriate method of delivery at term.

9. Many chronic valvular heart cases compensated and with only slight degrees of decompensation and some with 2° decompensation will safely deliver themselves if allowed to. Though this fact is undeniably true, theoretically, and with what data we have at hand, it should not be allowed.

10. Normal delivery and *accouchement forcé* have no place in the treatment of chronic valvular heart cases in pregnancy or labor.

11. It is not justifiable to attempt to carry a woman who is decompensated to term for the sake of her baby unless she reacts favorably to treatment almost immediately, especially as the fetal mortality in these cases is so high that we overrisk the mother for the sake of a problematical child.

12. "Cardio Pregnancy literature" on the whole is inadequate because no classification is used to determine the factors in the cases under discussion. Some classification is deemed necessary which will visualize, at least, the period in

pregnancy, the degree of decompensation and the character of the cervix and whether or not the patient is in labor. A tentative classification is offered in this paper and there is no briefer way to summarize the obstetrical handling of the cases under discussion than is done in this table of classification and the two paragraphs preceding.

Bibliography

[1] Newell, F. S.: Cardiac Complications of Pregnancy and Labor. Jour. Amer. Med. Assn., June, 1912; Sept. 28, 1912.

[2] Pankow: Frequency and Significance of Cardiac Disease. Deutsche Gesellsch. f. Gynak., May, 1913.

[3] Gröne: Pregnancy and Labor in Organic Heart Disease. All m. sven Lakaartid, Stockholm, 1913, Vol. x.

[4] Fromme: The Relations of Affections of the Heart to Pregnancy, Delivery and Puerperium. Deutsche Gesellsch. f. Gynak., May, 1913.

[5] Kreiss: Heart Disease and Pregnancy. Zentralbl. f. Gynak., 1913, Vol. xxxvii.

[6] Kreiss: Heart Lesions in Pregnancy. Deutsche Gesellsch. f. Gynak., May, 1913.

[7] Baisch: Researches Concerning the After-Life of Pregnancies Complicated by Heart Lesions. Deutsche Gesellsch. f. Gynak., May, 1913.

[8] Webster: The Conduct of Pregnancy and Labor in Acute and Chronic Affections of the Heart. Trans. Am. Gyn. Assn., May, 1913.

[9] Tuszkai: Heart Disease in Pregnancy. Amer. Jour. Obst., N. Y., November, 1912, Vol. lxvi.

[10] Barris, J.: The Treatment of Pregnancy Complicated by Morbus Cordis by Means of Cesarean Section under Special Anesthesia. Jour. Obst.—Gynec., Brit. Ewp., 1914, Vol. xxv.

[11] Eisenbach: Disease and Pregnancy. Beitr. z. Geburtsh. v. Gynak., 1913, Vol. xix.

[12] Pellissier: Blood Pressure and Viscosity of the Blood in Heart Disease During Pregnancy. Arch. mens. d'obstet. et de gynec., 1915, Vol. iv.

[13] Polak, J. O.: Morphine and Scopolamine Amnesia in Obstetrics. Jour. Amer. Med. Assn., 1915, Vol. lxv.

[14] Huntington, J. L.: Heart Disease in Pregnancy and Labor. Boston Medical and Surgical Journal, 1916, Vol. lxxiv, No. 7.

[15] Lawrence, C. H.: Failing Cardiac Compensation During Pregnancy. Boston Medical and Surgical Journal, Dec. 14, 1916.

[16] Heynemann, T.: Position of the Heart and Diaphragm During Pregnancy. Ztschr. f. Geburtsh. v. Gynak., 1913, Vol. lxxiv.

[17] Redlich, Prof.: Cardiac Changes During Pregnancy. Schewachoff S. W. Arb. a. d. Geburtsch. Gynak. Klin., St. Petersburg. 1913.

[18] Walthard: The Relations of Cardiac Disease to Pregnancy, Labor and the Puerperium. Deutsche Gesellsch. f. Gynak., May, 1913.

[19] Ries-Finley: Uterine Dystocia Secondary to Mitral Stenosis. Northwest Med., 1913. Vol. v.

[20] Schmidt: Heart and Kidney Affections During Pregnancy. Deutsche Gesellsch. f. Gynak., May, 1913.

THE TECHNIC OF ABDOMINAL CESAREAN SECTION, AND A REPORT OF SIXTY CASES.

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The technic described in this paper is essentially that employed by Dr. J. C. Hubbard, with whom the writer is associated, and the great majority of the cases reported are his cases.

In surgery, the best results are obtained by the operator who endeavors to keep his technic as simple as possible, and who, having determined the best procedure, always does an operation the same way. In this way confusion is eliminated, unnecessary assistants may be dispensed with, and the operator himself can do more skilful work. The patient needs less anesthesia and there is less danger of surgical shock. Abdominal Cesarean section by its very nature lends itself to simplification and standardization.

If the operation is to be performed on a fixed date, the patient is given a simple preparation the previous night. We believe that the most frequent cause for post-operative distention in these cases is too drastic a cleansing of the alimentary canal. Most patients were formerly given a generous dose of castor oil. Our patients are given no catharsis, and a simple low enema, repeated, if necessary, the morning of operation.

The abdomen is shaved and scrubbed with soap and water, followed by alcohol, and a sterile dressing applied. This dressing is removed at the time of operation, when the patient is sufficiently anesthetized, and the abdomen painted with half-strength tincture of iodine (3½%). If it is an emergency operation, the preparation consists of a dry shave, benzine, and full-strength (7%) iodine.

Two assistants, the anesthetist and somebody competent to resuscitate the baby, are necessary. This latter person is next in importance to the operator because, sometimes, Caesarean babies are very difficult to resuscitate; and should the baby die, usually the whole point of the operation is lost.

The instruments used are two scalpels, two pairs of scissors, two pairs of tissue forceps, and six hemostatic forceps. Seldom are more instruments used, but for emergencies a needle-holder, Cleveland ligature-carrier, and two hysterectomy clamps and a medium-sized retractor are put into the kit.

The needles used are of two kinds. For all the uterine sutures, peritoneum and fascia, a moderately large straight round needle is used. The skin sutures are placed with straight-cutting pointed needles.

The incision is made in or just to the right of the median line, about six inches long, and from the umbilicus down. The length depends somewhat on the size of the baby, but in any case, after the abdomen is closed it will be found to have shortened considerably because of the involution of all the tissues. The abdominal wall is very thin, as a rule, and is quickly incised and the abdomen opened. It is rarely necessary to stop for bleeding in the abdominal wound. The low abdominal incision is purposely made, because it makes the uterus more accessible and allows the operation to be done without the use of walling off packs. Save in one case of repeated section, no adhesions of consequence have been encountered. The uterus is never delivered upon the abdominal wall unless for a special reason, *e.g.*, when sepsis is feared and a Porro operation is to be done.

The abdomen having been opened, the second assistant now places a hand on either side of the abdomen, and with firm pressure steadies the uterus so that it will not rotate while being opened. With a clean knife, the anterior wall of the uterus is incised in the median line down to the membranes. Many times the placenta will be found presenting in the uterine wound.

This may be cut through or shoved aside. No attention is paid to hemorrhage, as it will stop considerably when the uterus is emptied. The membranes are now incised, a hand shoved into the uterus, a foot grasped, and the baby extracted. The assistants, meantime, have placed two clamps on the cord and cut it between them, and the baby is handed over to somebody for resuscitation.

One cubic centimeter of aseptic ergot is usually given intramuscularly by the nurse as the abdomen is being opened. Usually by the time the baby is extracted the uterus has begun to contract well. If it has not, another ampoule of ergot or pituitrin may be given, and involution of the uterus is further promoted by manipulation.

A finger is now hooked into the uterine incision and the uterus lifted up into the abdominal wound. An unfolded towel is tucked under the fundus to protect the abdominal contents. The placenta and membranes are extracted, taking care to get the pouch of membranes which extends down into the cervix. A gauze strip is placed inside the uterus to take up bleeding while sewing up, and this is removed before the last two sutures are put in. For suture material No. 1 chromic catgut is used everywhere, save in the skin. The sutures in the uterine wall go down to, but not through the endometrium. They are interrupted and are tied as they are placed, thereby saving considerable time. Eight or ten are usually enough. This line of sutures is now buried by a continuous right-angled or Lembert suture in the peritoneal covering of the uterus, which does much to prevent adhesions. Not much fluid will be found in the abdomen, and no attempt is made to wipe it out. The uterus is given a final squeeze to express clots, and the peritoneum is then closed with a continuous suture. Interrupted sutures are used in the fascia, although sometimes it is so thinned out that it is difficult to find as a distinct layer. Two or three stay sutures of silkworm gut are next placed, but not tied at this stage. The skin wound is then closed with interrupted silkworm gut sutures, and a rolled-up pad placed over the wound, over which the stay sutures are snugly tied to prevent oozing in the wound. The dressing is applied and fixed by a Scultetus binder, overlapping the ends from above downward, to exert pressure on the fundus of the uterus. A sterile vulval pad is also applied and fastened to the binder. It is well to note whether or not there is sufficient flowing from the vagina, because sometimes the cervix of a patient who has not been in labor is not dilated, and later it may be necessary to dilate the same because of retention of the lochia in the uterus.

In this paper it is not proposed to discuss the indications for Cesarean section in general. Enough has recently been written upon that subject. Merely the indications in the cases to be reported will be given, together with such facts as seem of interest. They are as follows:

ELDERLY GRAVIDA.

1. Age 38. Hydatidiform mole 13 years ago. Mental breakdown one year ago.
2. First pregnancy, macerated fetus. Second pregnancy, six months' miscarriage. Mental breakdown over possible loss of this baby.
3. Age 44. Primipara.
4. Elderly primipara with tremendous fibroid uterus which became incarcerated at three months, and was freed with difficulty. Section followed by hysterectomy.
5. Age 41. Primipara, with toxemia increasing in spite of treatment. Twins, 6¼ and 6½ pounds.
6. Age 43. Primipara, married 10 years.
7. Age 40. Primipara with partly detached placenta. Baby resuscitated with difficulty. Lived 20 hours.
8. Primipara, married 12 years.
9. Age 42. Primipara, with ruptured membranes. Second section one year later.
10. Age 41. Primipara.

JUSTO-MINOR PELVIS.

1. First baby lost. This pregnancy, transverse presentation.
2. Primipara with floating head. Given test of labor.
3. Pelvic inclination also faulty. Four Cesarean sections.
4. Undilated os and high head after test of labor.
5. First delivery, high forceps followed by severe post-operative shock. Two Cesarean sections. Both large babies.
6. Thirty-five-year-old primipara seen in consultation. Hard labor for 16 hours with tonic uterus. Anxious for living baby. Maternal death on fifth day. Peritonitis? Great deal of post-operative distention, not much relieved by an enterostomy. No pus found.
7. Two sections.

FLAT PELVIS.

1. Previous operation for atresia of vagina,
2. Seen in consultation. First two babies very difficult forceps deliveries and sustained permanent disfigurements. In labor six hours. Breech presentation.
3. Two sections.
4. First baby normal, but difficult forceps delivery. Two succeeding babies had ascites and did not live. Fourth pregnancy, Cesarean section. Done at 8 months on medical advice, in hopes of getting healthy baby. Fetal activity had been decreasing. Macerated fetus. Fifth pregnancy, Cesarean section. Labor began at 6 months. Also ascitic baby.

MALE PELVIS.

1.
2. Age 38. First pregnancy; vaginal Cesarean section at 7 months for toxemia. Craniotomy.

TOXEMIA.

1. Increasing in spite of treatment.
2. Increasing in spite of treatment. Blood pressure, 200.

3. After first baby, two operations for prolapse, done abroad. Cervix protruding from vagina. Toxemia in last week, which increased rapidly in spite of treatment.
4. Consultation. Toxemia not reported until after operation. High head; no progress in hard labor. Post-partum eclampsia. Died on fifth day.

DIFFICULT FIRST LABOR.

1. First baby lost. Difficult high forceps. Recto-vaginal fistula, twice repaired. Eight years later, extra-uterine pregnancy. Cesarean 10 and 15 years later.
2. First baby lost. Two sections.
3. First baby lost (premature); post-partum eclampsia. Second pregnancy, high head with ruptured membranes.
4. First delivery by high forceps for uterine inertia. Complete tear and subsequent repair. Cesarean 4 years later.
5. Two babies lost by forceps deliveries in hands of expert obstetricians.
6. Consultation. First delivery, hard forceps. Second, transverse. Baby died. Third, Cesarean. Transverse presentation. Mother had sacro-iliac disease.
7. First baby, hydrocephalic. Craniotomy. Second baby, large with well ossified head. Uterine inertia. Cesarean section.

DIABETES.

1. First baby lost. Cause?
2. Test of labor. Cesarean section with novocain anesthesia.

CARDIAC LESIONS.

1. Double mitral disease. Slight decompensation.
2. Mitral regurgitation. Membranes ruptured before labor began.
3. Mitral regurgitation. Had been decompensated. Second Cesarean at 6 months because started in labor. Heart competent.
4. Mitral regurgitation. Slight decompensation.

UTERINE INERTIA.

1. In labor 24 hours. Poor and irregular contractions. Rigid soft parts.

PREVIOUS CESAREAN SECTION BY OTHER OPERATOR.

1. First Cesarean because of eclampsia at 8 months.
2. First Cesarean because of pelvic disproportion.

TUMOR OF CERVIX.

1. Consultation. Bleeding necrotic tumor of cervix.

PELVIC DISPROPORTION.

1. First delivery by skilled obstetrician. Complete tear. Second, Cesarean; 11-pound baby.
2. First delivery difficult. Bad tear. Second, large baby.
3. First baby lost. Second, large baby.

DISTORTION OF CERVIX.

1. First, high forceps delivery and manual dilatation because of uterine inertia. Second, Cesarean. Cervix pointed back to hollow of sacrum. Os not palpable after several hours in labor. Flabby muscles.

ELECTIVE CESAREAN.

1. Pelvic measurements normal, but head high. Cesarean elected after situation explained to husband and wife.

In this series of cases there were two maternal deaths. Both of these patients were seen in consultation after they had been in labor a considerable length of time. Without trying to dodge responsibility, it is only fair to say that the obstetrician has less chance of obtaining good results in another's patients seen late in labor than he has in his own patients seen constantly.

The first of these patients was suffering from toxemia; a vertex was presenting, but high, and in spite of hard labor for a number of hours, was not making any progress. There was so much edema of the vulva and vagina that ordinary methods of delivery were out of the question. She developed post-partum eclampsia and died on the fifth day. The operation was justifiable and was not the cause of death.

The other patient was an elderly primipara seen late in labor, with a generally contracted pelvis and a tonic contraction of the uterus. She was anxious to have a baby. Delivery from below would have meant a very difficult operation, with almost inevitable loss of the baby and grave danger to the mother. The patient was already in a hospital, and Cesarean section was decided upon. A large incision was made and the uterus was entirely delivered before opening it. Following the delivery of the baby a hysterectomy should have been done, as we now see the facts, but sepsis did not seem probable, and the usual routine was followed. From the second day the temperature became elevated, and there was a great deal of distention. On the fifth day an enterostomy was done for relief of this condition, and at this operation no fluid was found in the abdomen, although no real exploration was made on account of the patient's condition. She died the same day. This case serves to emphasize the fact that there is a mortality in Cesarean section, even in the hands of well trained and careful operators, and that the possibility of sepsis in late cases should always be borne in mind.

There were no fetal deaths in this series that could be charged to the operation. One baby died in nine hours from prematurity. It was a six and one-half months' baby, and the operation was done solely because, having had a previous Cesarean and starting in hard labor, it was deemed necessary to repeat the Cesarean. One baby died from intracranial hemorrhage due to intra-uterine asphyxia from a partly detached placenta. This baby lived twenty hours. One baby died on the tenth day from umbilical sepsis.

Of complications, there has been a striking absence. The cervix had to be dilated in two patients because of retained lochia. Three patients had a moderate phlebitis and made good recoveries. In all three cases the uterus was entirely delivered before incising it. Two of these patients were operated upon eleven years ago, and a portion of the technic then used has long since been discarded. It was at that time thought necessary to have one assistant squeeze the cervix as tightly as possible while working on the uterus in order to shut off the uterine arteries and stop hemorrhage. Possibly this may have had some relation to the phlebitis later developed. One patient had two pulmonary emboli, followed by consolidation of one lobe, and completely recovered. One case of peritonitis has already been mentioned. There have been no instances of acute dilatation of the stomach. But five cases have had post-operative distention. In three of these the uterus was delivered before it was opened. One patient was a cardiac, and as such particularly liable to have distention. One of the operations was done entirely with local anesthesia, and one case of distention was due to peritonitis.

Silk sutures were used in the uterus until about three years ago. In order to simplify the technic, No. 1 chromic catgut is now used throughout the operation, and no bad results have followed. In the last forty-four cases the uterus has been delivered but twice, and for special reasons.

Nine patients have had two sections and one has had four. The convalescence has been afebrile in each case. Two had slight omental adhesions to the uterine scar. In the patient who had four sections, at the last operation the uterus was found adherent to the lower two-thirds of the abdominal scar. The uterine scars were all solid.

The two most important factors in the avoidance of post-operative distention seem to be the omission of any catharsis in the preparation of the patient, and the absence of manipulation of the abdominal viscera at the time of operation. The latter is, of course, due to not delivering the uterus, and not using any gauze packs, unnecessary because of the low incision. During convalescence the patient is encouraged to eat solid food as soon as possible, and is given a mild cathartic at the end of twenty-four hours.

Speed in operating is not the most important object, but it is worth while if it can be readily obtained. Constant repetition and the simplicity of the technic has made the operation a quick one, and it has frequently been done in twelve minutes from start to finish, and once in twenty minutes from the beginning of anesthesia. This saving of time is important because it decreases the amount of anesthetic and lessens the danger of shock to mother and baby, and while either or both may stand a long operation, why prolong an operation which is done primarily to save mother and child wear and tear?

BLEEDING IN PREGNANCY.*

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Hemorrhage in itself is the single most serious condition in obstetrics, as it is in medicine. No matter what may be its cause, loss of blood may be irretrievable. It is a symptom which needs immediate treatment and in most cases that requires an accurate diagnosis. Tonsillectomy is a simple procedure, an operation looked upon as not major, yet its post-operative hemorrhage may be fatal if its arrest is not immediately obtained. Acute appendicitis is distinctly a surgical emergency, but an hour or two of delay seldom would change the outcome of the case as would such a delay in arresting hemorrhage. Once a patient has been exsanguinated, no matter how physically perfect a specimen he may be, treatment is unavailing. Loss of blood cannot be looked upon with impunity. Any hemorrhage may be the symptom of a condition which, undetected, may be fatal at any moment.

This symptom during pregnancy is most suspicious. The true obstetrical emergencies are accompanied by it. Any such case may be serious and should be looked upon from that point of view. The unintelligent waiting policy, allowing nature to effect a cure, without the establishment of a diagnosis, is almost malpractice. Telephonic communication of such cases is unjust to the patient. A delayed visit until tomorrow is inexcusable; tomorrow may be too late. Treatment must be initiated quickly, and intelligent treatment rests on an intelligent diagnosis.

Bleeding during pregnancy is a comprehensive subject and it can be best understood if the conditions with which this occurs be gone into separately at stated periods.

For definiteness I shall consider those conditions which occur during the first three, the second three and the last three months of pregnancy, and I shall try to outline treatment for each in a specific way.

During the first three months of pregnancy, the conditions with which the uterine bleeding is associated are miscarriage, cervical polyp, carcinoma of the cervix, ectopic pregnancy and hydatidiform mole. Of these, miscarriage is by far the most common. Its treatment depends upon its type,—threatened, incomplete or complete, and septic. If a patient whom we have never seen, one whom we have not examined during this pregnancy, begins to bleed, I believe that a vaginal examination must be made immediately. If we have seen and examined the patient previous to the occurrence of bleeding and know that only a pregnant uterus is in the pelvis, examination may be deferred if the bleeding does not demand immediate treatment because of its severity. But the danger of converting a threatened into an inevitable miscarriage in a patient whom we see for the first time (by making a vaginal examination) is far outweighed by the possible finding of some other condition causing the flowing, and should not deter us from making such an examination. If, however, we see a case of threatened miscarriage, one having uncomfortable abdominal pain with little or no flow, in a patient whom we know to have a normal pregnancy, the treatment is rest in bed, with morphia, without vaginal examination. If the flow continues and becomes the nature of a hemorrhage, an internal examination will reveal a dilated cervix with part of the products of conception still *in utero,* an incomplete miscarriage. The logical treatment of such a case is to control the bleeding, and that means emptying the uterus by curettage of its contents, now foreign, thus enabling the uterus to shut down and control its bleeding normally.

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Little or nothing need be done to complete miscarriages. If complete, the uterus has expelled all the contents of conception and the bleeding has ceased. Rest in bed, to favor involution, is all that is needed.

The treatment of septic miscarriage, unless there be bleeding, which means that the uterus still contains foreign material, should be distinctly conservative. If the patient be septic, little good will come from intrauterine manipulation, and vast harm may ensue. Intrauterine douches may mechanically wash out débris, but the bactericidal value of any douche holds itself open to considerable question. Undoubtedly, curettage on some mildly septic cases has been followed by general sepsis, nature's leucocytic wall has been torn down and the localized infection has rapidly spread into the general circulation. Quite truly, débris may be looked upon as culture media, but, unless infected, it is harmless, and how better can it become infected than by having organisms put into the uterus by passage through a vagina which we cannot sterilize? Of course this passive conservative treatment does not apply to those septic cases which are bleeding. Here the bleeding must be stopped and its cause removed. Finger curettage of foreign material is less destructive than too vigorous instrumental curettage. After the hemorrhage has been controlled the treatment is medical, with fresh air holding the most important rôle. Some complete and incomplete miscarriages bleed tremendously, almost to the stage of exsanguination. Morphia, salt solution, rectal, sub-pectoral, intravenous, and, occasionally, transfusion, are the mainstays in such a condition. Rarely will transfusion seem necessary. Iron, arsenic, fresh air, good food, rapidly stimulate the blood-forming centres.

I have not mentioned the need of making vaginal examinations on all miscarriage cases under the most rigid asepsis, because in these days such admonitions ought not to be necessary. It is almost better to allow the bleeding to continue than to attempt to diagnose its cause by examining with unclean hands.

Cervical polyp, another condition with which we associate bleeding during the early months of pregnancy, is not frequently met with, but should always be borne in mind. It seldom occasions much bleeding and may even, if untreated, not result in miscarriage. Its diagnosis is made by inspection, the polyp appearing through the cervix. Its treatment is the excision of the polyp or tying its base off with silk.

The consequence of not examining bleeding cases is never so harmfully illustrated as in those patients who have ectopic pregnancy. This condition may give symptoms after three months, it may go to term, but by far the greater per cent. occur before the end of the third month. The diagnosis is made almost entirely by vaginal examination. Of course the appearance of a pregnant woman in extreme shock, with rapid pulse and quite blanched, who has not suffered external hemorrhage, would lead to the diagnosis of concealed hemorrhage, and the presumptive diagnosis of ectopic pregnancy would probably be correct. It is rare, however, for the condition to present itself in such an alarming manner. Usually the irregular flow of rather unusual blood, with or without abdominal pain, will be enough to arouse the patient to the need of consulting medical advice. Such a case must be examined vaginally,—and a doubtful pelvic mass with a slightly enlarged uterus should always suggest the serious possibility of ectopic pregnancy, and such a possibility may be made definite by examination under an anaesthetic. But even then, if serious doubt exists, today, when laparotomy is so safe, better to explore many questionable abdomens than to allow one to escape with subsequent rupture.

The ruptured cases are easier of diagnosis because they show evidence of hemorrhage (rapid pulse, pallor, subnormal temperature), have shifting dulness in the abdomen and by vagina show definite pelvic mass tender because of peritoneal insult. These signs and symptoms mean laparotomy. The vaginal route is unsafe; subsequent abdominal section may be necessary to control bleeding. There are a few ruptured ectopic cases in such poor shape that immediate operation would prove fatal. Better to allow such cases *in extremis* a few hours to recuperate and then better stand the shock of laparotomy. It is rare rather than the rule to find active bleeding when the abdomen is opened, and so it is safe to wait on those few who are in collapse. The operation often must be done very quickly, merely the tying of the tube, to arrest hemorrhage, and the evacuation of as much blood clot as is possible. Other cases need not such haste. When time is not a factor, it is well to evacuate all the blood clot free in the peritoneum. Such cases do not need drainage. They may be sewed up tight.

Sometimes the loss of blood is so great that salt solution or transfusion is necessary. The after-treatment is merely that of any laparotomy.

The third condition with which bleeding in the early months of pregnancy is associated is malignant disease of the cervix. This condition is rare, but should always be borne in mind. Carcinoma does occur in young women; youth is no barrier. Its diagnosis is made on the induration of the cervix, its bleeding on touch and upon the microscopic examination of snippings of suspicious tissue.

The treatment of this condition depends entirely upon the extent of the disease. An early carcinoma, one in the operative stage of growth, should be treated as though there were no pregnancy, by radical hysterectomy. To defer operation until the end of term, would change an operable case into one beyond operation. Of course, the patient has a voice in which shall be done. If she insists that the baby's problematical life is more valuable than the best chance her one has, that is her prerogative. We must abide by her decision. If, on the other hand, pregnancy exists along with a case of advanced carcinoma, there is no advantage in sacrificing the baby. There is nothing to be gained for the mother by so doing. Rather, let the added pelvic engorgement of pregnancy spread still further the carcinoma, for in so doing the life of this poor patient is humanely shortened. The only real problem in such cases comes up at term, when delivery is imminent. The child's life is really very valuable; risking delivery through carcinomatous tissue is unwarranted and may result fatally to both patients. Caesarean, without doubt, is the operation of choice, thus ensuring a live baby. In the case of the early carcinoma which insisted upon continuance of pregnancy, Caesarean, too, is advisable and measures may be later advised to limit the cancerous growth, such as cauterization, morcellation or radium, as the case may be.

Hydatid mole is the fourth condition occurring in the early months of pregnancy of which the symptom is bleeding. Its diagnosis is made on the size of the uterus, its feel and the presence in the pinkish discharge of grape-like bodies. The uterus harboring a mole is larger than it should be at the given stage of pregnancy; it is softer, has not the resiliency of pregnancy. The hemorrhage associated may be extreme. An absolute diagnosis cannot be made sometimes until the "grapes" are obtained in the discharge or by the curette. Its treatment is curettage. Although these uteri bleed freely until all the mole has been expelled or scraped out, they usually contract well afterward. Occasionally, gauze packing is necessary. In those cases at three months whose cervices are still stiff and undilated, the operator has the choice of dilating immediately, of cutting, or of softening the cervix by gauze packing or the rubber bag. It seems to me that vaginal section is less shock, is quicker, is accompanied by less extensive bleeding than dilatation, and such a method has preference in those cases which require immediate emptying.

Besides the hemorrhage there is present always the possibility of subsequent degeneration into chorioepithelioma. Such degeneration is very serious, for the carcinoma is of a malignant metastasizing type. The uteri grow very rapidly in size, and scrapings confirm the diagnosis. The treatment is radical hysterectomy.

During the second three months of pregnancy, miscarriage, threatened or complete, is the really only important condition which may arise, which might not have given symptoms earlier. There is one other condition which may be dismissed with a word, and that is everted, eroded cervices. Because of the congestion due to pregnancy this type of cervix may bleed a little during these months or even later. Its diagnosis is made on inspection. The cervix looks red, angry, and bleeds on swabbing. Its treatment is the application of some astringent, like iodine.

There is more to be said of miscarriage. If some bleeding occurs during these months, with uterine pains and contractions, the case should be treated as a threatened miscarriage until smart bleeding or continued increasingly severe contractions prove its character. These cases need not be examined vaginally. Little is to be gained, and often such manipulation will precipitate a complete miscarriage. Rest in bed, with morphia to the limit, is the only treatment. If these are not successful, labor will continue, and unless the placenta does not come away, nature may be left to herself. Those cases which quiet down should be kept in bed for 10 days, at least, before attempting to resume normal life.

In the last three months the conditions associated with bleeding are (1) premature labor, (2) ruptured varicosities, (3) placenta praevia, and (4) detached placenta.

The diagnosis of premature labor is made in the presence of uterine contractions and a bloody show. Morphia alone will avail in attempting to tide over the pregnancy. If the contractions do not cease, with the morphia used to its limit, the case may be left to nature and treated as any case at term.

A word will suffice for bleeding from varicose veins. That uterine pressure is not sufficient until late in pregnancy is the reason why the veins do not usually rupture before. On inspection, the ruptured veins may be seen anywhere inside the vagina or on the labia. Pressure, occasionally ligature, will control the bleeding, and rest in bed, and a more quiet life, will tend to limit the possibility of recurrence.

Placenta praevia and separated placenta are the true surgical emergencies of obstetrics.

Placentae praeviae are of three types, according to their location over the cervix,—central, marginal and partial. Any case that bleeds may be a praevia or something as serious. No man is justified in carrying a bleeding case on the telephone. The condition may be alarming; a diagnosis must be made and made immediately. This means seeing the patient and examining her vaginally. The possible danger of getting into a complete praevia and starting up a severe hemorrhage on examination is present in all bleeding cases, and great care must be exercised in such examinations. If the private home cannot become a hospital, the patient should be taken to a hospital. Everything should be ready to do whatever is necessary when the examination is attempted. It is best to examine these patients under an anaesthetic, if an examination without has revealed no cause, so that nothing may be missed. Such precautions may be unnecessary many times, but the one time will come which will justify the system.

The diagnosis of complete praevia is made by vaginal examination on a woman who has flowed, after 6 or 6½ months, by feeling the cushion-like resistance all over the cervix between the finger and the presenting part. If the patient be bleeding, something must be done to control the bleeding.

The treatment depends on the stage of pregnancy, the parity of the patient and the condition of the cervix, whether the bleeding still continues or has ceased and whether the patient be in labor or not. A complete praevia in a primipara at seven months, actively bleeding, requires immediate treatment to save the mother's life. We must consider the conditions existing and choose that method of emptying the uterus which will ensure her the best chance. Rapid *accouchement forcé* is the one operation on a primipara not in labor which I think ought not to be done. The risk of tearing the cervix badly, in the operator's haste, is a real one. Many praeviae have lost their lives because of too energetic vaginal operating. The operation and the operator really should shoulder the blame of much mortality attributed to a praevia. The use of the rubber bag, either intra- or extraovular is used in some clinics and with excellent results. The bleeding is controlled by the bag, the cervix is dilated slowly, not divulsed, and the shock is much less. In this method the baby, even though it is only seven months, is sacrificed.

Vaginal Caesarean is a method of quickly emptying the uterus, which has not the shock of *accouchement forcé*. Up to 7½ or 8 months it is an operation of great value in conditions requiring haste. In placenta praevia it can be used only when the placenta is not on the anterior wall. The delivery after the section is accomplished by version, the operator's hand controlling the bleeding by pressure against the bleeding uterine sinuses. Inasmuch as such uteri tend to bleed after delivery, the suturing of the incision may be much hindered and the sinuses cannot well be packed until the suture is completed. Abdominal Caesarean offers the quickest method, the one attended by least loss of blood and the one which gives the very unstable fetal life its best chance. The objection is the constant need of future Caesareans, with perhaps only a dead premature baby to justify its use.

If a complete praevia is diagnosed in a primipara at seven months, in labor, with a cervix soft, taken up, and partly dilated, the Braxton Hicks or the bag is the means which best meets the conditions. With such a cervix there is not the probability of such extreme laceration. The shock of *accouchement forcé* is not present, and while the baby's life is thus forfeited, I think the mother's chances are so good that the after necessity of Caesarean section is not warranted.

A complete praevia at seven months in a primipara, when bleeding has ceased, should be treated expectantly, with rest in bed. Everything possible should be done to tide over the pregnancy until eight months or more, for the sake of the baby. The patient should stay in a hospital, where immediate operation may be attempted at the first sign of bleeding. I think the operation in such cases is abdominal section.

A multipara with a complete praevia at seven months, actively bleeding, should be emptied immediately. If the cervix be soft a bag may be introduced and labor allowed to proceed. Even here an *accouchement forcé* may be permissible. It all depends upon the cervix. One might as well lose a patient because of praevia untreated as to lose her because of the operation chosen. Rigid cervices, those which will dilate with difficulty and may tear, might better be cut. If the placenta lies on the anterior surface it will cause much bleeding during the operation. It must be admitted that in this type of case the abdominal Caesarean will prove the safest, easiest operation, the one entailing the least shock in the hands of most operators.

If the patient be in labor, with almost any dilatation, the vaginal route is the best. Dilatation is usually easy and not shocking. Braxton Hicks method has its advocates. The rubber bag can be used. The choice here will depend much upon the individual operator and his habit. I think, however, that few thoughtful operators would deem the danger of vaginal delivery so great as to justify the abdominal route.

It is so infrequent that bleeding occurs at seven months from partial and marginal praeviae that I think the treatment of this type might better be considered at eight and nine months.

For the complete praevia in a primipara, not in labor at eight months, actively bleeding, I think that laparotomy covers the conditions more satisfactorily than any other operation. It is quicker, it is less shock, it ensures a live baby. No other method can with the same definiteness ensure these factors.

The bag often causes fetal death, particularly if used intraovularly. Hemorrhage, too, may not always be entirely controlled.

Accouchement forcé is contraindicated for the reasons before mentioned.

Vaginal Caesarean is here very risky because of the size of the baby, and is contraindicated if the placenta be on the anterior uterine wall.

Braxton Hicks practically disregards a really good baby and necessitates some continued bleeding during the dilatation before the version can be attempted.

A complete praevia at eight months in a multipara with bleeding requires immediate emptying of the uterus. If she be not in labor, then the operation chosen will depend upon the cervix. If this be rigid, with scar tissue, the abdominal route is safest and ensures a living baby. If the cervix be soft, easily dilated, some competent men prefer the radical *accouchement forcé* to more conservative measures. The bag may be used, and Braxton Hicks has its advocates. The vaginal section is questionable, depending upon the size of the baby and the location of the placenta.

If she be in labor, some vaginal route may safely be chosen. Almost any dilatation will ensure complete dilatation with ease and without much shock. The bag and Braxton Hicks may also be used. Laparotomy here, in most hands, will ensure the best maternal and fetal results, but its necessity would not be so acute in the hands of men skilled in vaginal operating.

Complete praevia in a primipara at term, actively bleeding, not in labor, is best treated by laparotomy. No other method will give as nearly good results. The size of the baby contraindicates vaginal Caesarean. The bag is risky; *accouchement forcé,* too strenuous. Complete praeviae bleed before labor starts and at its inception, and it is quite unusual to see a case with much dilatation. In any event, the abdominal route is by far the safest.

A complete praevia at term in a multipara with active bleeding, if she be not in labor, will be best treated by laparotomy. No matter how soft the cervix is, much blood will be lost in any vaginal manipulation. The bag can be used, *accouchement forcé* can be done, but neither is satisfactory. The bag, if it be intraovular, loses the baby. If extraovular, it causes much bleeding during its introduction. The *forcé* is a serious operation and one attended by much shock. The abdominal route is safe, quick, causes no extra loss of blood and is not attended by shock.

If a multipara be in labor and partly dilated, a manual dilatation or a Braxton Hicks may more safely be done. A bag may be used but not so successfully. Even here the laparotomy is justified. But whether it is really wise or not will depend upon the cervix.

A partial praevia in a primipara not in labor, actively bleeding, is not quite so serious a condition, but this of course depends upon how much of the cervix is occluded. The hemorrhage, however, must be stopped, and there are several means which might be attempted, all aiming to exert pressure on the sinuses and thus arrest bleeding. The dilatation of such a cervix, sufficient to introduce a rubber bag, should not be very difficult, and should not cause much extra bleeding. The bag in place will serve to stimulate the onset of labor and by its pressure against the placenta and sinuses control bleeding. A two-pound weight attached to the bag and suspended over the foot of the bed will keep the pressure constant.

I think the bag is preferable to Braxton Hicks method, which causes more bleeding during its accomplishment and forfeits the baby in a large per cent. of cases.

I do not think *accouchement forcé* is any more practical here than elsewhere.

The vaginal Caesarean will accomplish rapid emptying of the uterus, but the eight months' baby makes the operation difficult. Whether laparotomy is indicated will depend much upon how great an area of cervix is occluded.

The operation will give good results, but I think, in most cases, the bag will ensure the maternal safety, and I somewhat doubt whether repeated Caesareans are quite justifiable.

Partial praevia in a primipara at eight months, in labor, will be treated according to the degree of dilatation. A bag will here fulfill the requirements unless the cervix be as much as half dilated. In such cases Braxton Hicks, or manual dilatation, allows immediate delivery and gives the baby a better chance than the Braxton Hicks.

Vaginal Caesarean is unnecessary and the eight months' baby almost is big enough to question its advisability. Laparotomy is unnecessary.

If a partial praevia is diagnosed in a primipara not in labor when bleeding has ceased, the patient should be kept quietly in bed in a hospital until bleeding again appears. Then the choice of operations will depend upon the amount occluded and the type of cervix. If the cervix be very stiff and rigid, laparotomy is indicated. If it be soft, a bag is the best treatment. It is fair in these cases to put it up to the patient. While Caesarean may not be absolutely necessary, it has much to be said in its favor. If the family say no chances at all are to be taken, laparotomy must be done.

Partial praevia, actively bleeding in a multipara not in labor, requires immediate emptying, and the operation must rest upon the type of cervix and the operator. If the cervix be not dilated, rather stiff, a bag is the best means.

It controls bleeding, starts up labor generally, and does not subject the patient to the shock ensuing upon *forcé* or so great possibility of a severely lacerated cervix. If the cervix be soft and easily dilated, manual dilatation with version or the Braxton Hicks will be the operation chosen by some operators, according to their custom. The Braxton Hicks jeopardizes the baby's chances but does ensure control of bleeding.

I think, however, the more conservative bag is the procedure which in most hands will give the best results.

There is, of course, the objections to the bag that in a small per cent. of cases labor does not ensue upon its introduction. If this be so, while it is in, the bleeding is controlled and the cervix is softened, so that when other means must be resorted to, the cervix is easier to dilate and the operation easier and accompanied by less shock. I do not think the abdominal route justified in this type unless the cervix be so full of scar tissue that it cannot dilate.

If a multipara be in labor and has a partial praevia some vaginal operation is indicated. A bag may be safely used but usually the cervix is easily dilatable so that the uterus may be immediately emptied.

Braxton Hicks may be used but complete dilatation can so easily be accomplished that the extra chance for the baby outweighs the slightly greater risk to the mother. The bleeding that accompanies the dilatation is controlled by the operator's hand.

The partial praevia in a primipara at term, not in labor, may be treated by a bag or by Caesarean. The bag will control bleeding, it will start up labor and accomplish dilatation slowly. If the praevia cover the os almost completely the abdominal route is justified. Vaginal Caesarean is contraindicated because of the size of the baby. The *accouchement forcé* has no place. The bag is safer.

The partial praevia in a primipara in labor will be treated according to the dilatation and the character of the cervix. If the cervix be half dilated, finish the dilatation manually. If the cervix be only slightly dilated, the bag is preferable. Too many *accouchements forcés* have resulted fatally. Conservative treatment, arresting hemorrhage and stimulating labor, gives better maternal results. Laparotomy may even here be justifiable if the cervix be not much dilated and the praevia an almost complete one.

Partial praevia in a multipara at term, actively bleeding, not in labor, should be treated entirely according to the cervix. I am sure that in these cases, irrespective of the softness of the cervix, better uniform results will be obtained from the bag than from any more radical operation. It is a great temptation when, the patient etherized, a soft cervix is found, to dilate it. Often it would be permissible, and in a skilled operator's hands it might not be so very dangerous. But ruptures do occur. The bag is so safe, it is really so sure, that its general adoption in this class will be attended by the best results, I feel sure.

Laparotomy is unnecessary. Braxton Hicks requires some dilatation. Vaginal Caesarean contraindicated.

In multiparae in labor, manual dilatation, complete, or enough to do Braxton Hicks, or the bag, to control hemorrhage until complete dilatation, are the best methods. Most cases will stand dilatation unless the cervix be very rigid or with much scar tissue.

The marginal praevia is the least serious of the three types. Rarely does it bleed until term or until labor starts. The patient is often well dilated before any bleeding occurs. The bag is the best means of dilatation in a primipara, if not over two fingers, and it might be said that the bag is the best means up to half dilatation. Then the waters may be broken, forcing the engaged head onto the placenta and thus controlling the bleeding. Manual dilatation and forceps or version may be done but the more conservative means mentioned are the best. Laparotomy is unnecessary.

In multiparae a bag may be used, manual dilatation and version, or the rupture of the membranes,—all will give good results. More serious operative procedures are not necessary.

Separated placentae have been considered rare emergencies of obstetrics. Almost all cases of serious bleeding have been classified as praevia, even after examination and operation had failed to reveal a praevia. There are so many cases in which bleeding occurs late in pregnancy in which no praevia is present, that some degree of detachment must be much more common than is generally supposed. Most of these cases do not bleed very much and many cease entirely after a single small hemorrhage, but some give rise to so much bleeding that operative interference becomes necessary.

This condition and its extreme danger were clearly presented by Williams of Johns Hopkins in November, 1915. In *Surgery, Gynecology and Obstetrics* for that month he reported two cases occurring in his practice in which abdominal section was done, followed by Caesarean and hysterectomy. The pathological report shows almost the only advance in obstetric pathology of recent years. The uteri in both cases refused to contract under drugs, mechanical and manual stimulation and hence had to be removed. The muscle looked bluish, there was macroscopic hemorrhage in uterine muscle, broad ligament and ovary and under the microscope there was hemorrhage between the muscle fibres of the uterus, and the small vessels showed degeneration. This degeneration is a new condition, never before reported, and to it Williams attributes the separation of the placenta. The cause of this degeneration he does not know.

That all detached placentae result in such hemorrhage into the uterus, that contraction of the organ is impossible after the delivery, is manifestly untrue, else all such cases would die, which is not so. That any case in which a diagnosis of detachment has been made ten hours before operation may fail of contractions, Williams has proved, and has shown the folly of such watchful waiting.

The diagnosis of the normally situated detached placenta, ablatio placenta, is made by the feel of the uterus and the elevation of the pulse. The uterus is tight, boardlike in consistency, the degree depending upon the amount of blood in the uterus. The pulse, pallor, restlessness, air hunger, depend upon the amount of blood lost. External bleeding is slight in these types. The patient may complain of bursting pain in the abdomen, but any case in the latter months of pregnancy, whether or not she has sustained bodily trauma, the old etiological factor, which shows a tight uterus, with rising pulse and some external bleeding, should be diagnosed as a placenta ablatio. The treatment has only to deal with the mother, as the baby of necessity is dead. The condition is the most serious of which hemorrhage is a symptom. Palliative means in no way cover the condition. The uterus must be made to contract, and that means it must be emptied. Unlike placenta praevia, in which a bag may be used to control the bleeding and the case allowed to go on in labor, here we have no means of getting at the uterine sinuses, without immediate emptying.

The only operation which is logical and which does not subject the mother to too great risk, in a primipara not in labor, is Ceasarean section. While attempting to dilate the cervix of such a case, the bleeding continues and at the end of an *accouchement forcé* the mother may have sustained so much loss of blood that, with the resulting shock, she cannot recover. Vaginal Caesarean in cases before eight months offers a better chance on a primipara than any other vaginal operation. If a primipara be in labor when the condition arises, the dilatation and the softness of the cervix will be the determining factors in what operation to choose. If the cervix be soft and dilates easily, the vaginal route may seem safe enough. If the cervix be not soft and offers much resistance, laparotomy will better fit the emergency.

In a multipara not in labor all depends upon the cervix. If it be soft and one that will dilate easily, the vaginal route may be chosen. If firm, with scar tissue, better choose the abdominal route. If the vaginal route be chosen, dilatation must be accomplished completely and quickly. Braxton Hicks is contraindicated. The loss of blood sustained during the extraction of the baby through a partially dilated cervix may be more than can be endured. The operation must be done quickly. The bleeding must be stopped.

If a multipara be in labor, unless the cervix be very resistant, the vaginal route is quite safe.

The bag is contraindicated. It softens and dilates the cervix but the bleeding continues.

The partially detached placenta, which may be situated low on the uterine wall, usually gives much external bleeding and the ligneous character of the uterus is lacking. If such cases be seen not in labor with active bleeding, they must be emptied. Laparotomy is better for the primipara and safer for the multipara if the cervix be rigid. If the condition first appears when labor is under way, the character of the cervix will determine the method to be chosen, the same principles before mentioned to be followed. But here, as in ablatio, the bag is not rational.

These cases when seen after bleeding has ceased and the diagnosis of praevia excluded may be left quite alone. They will often have no more attacks and go safely on to normal delivery at term.

THE MANAGEMENT OF LABOR.*

By G. P. Twitchell, M.D., Greenfield, Mass.

It is a trite saying that "it is the little things in life that count" and that nothing tends more to assist a young man in building up a medical practice than his success in obstetrics. It is in this branch of our practice especially that attention to the little things tends to make our patients more comfortable and less liable to the dangers of possible infection. I feel that no apology is needed in presenting this every-day subject to your consideration, and I assure you that the suggestions I present are not with the idea of instructing you but simply that we may, by discussion, exchange ideas and methods in carrying on this so common a practice that opens before all of us who are general practitioners.

There are three general heads under which we may discuss the management of labor—the comfort of the mother, the safety of the mother and the safety of the child. My subject being the management of labor, I will make no comment on the previous care, taking it for granted that the case has come to term in a normal condition, with the kidneys functioning properly and it having been determined that there is no pelvic deformity or distortion to interfere with a normal birth.

It is always unfortunate to have to approach a labor case as a stranger to your patient, the mental status of the woman being a very important factor in the comfort or suffering which she may experience during the first stage at least. Faith and confidence in the accoucheur is a very important element. I feel that it is our duty to call upon our patient as soon as word is received of the beginning of labor pains. This is especially important in primiparae, but in all cases it is wiser to determine by personal inquiry and observation just what is happening and what we may expect. I first endeavor by external palpation to determine the position of the fetus and also by auscultation the rapidity of the fetal heart. I generally make a vaginal examination at this time, to determine whether the pains are true or false and what progress is being made in dilatation. This means that I must exercise aseptic precautions against causing infection. The hair from the vulva and pubes should be clipped and the region between the thighs, around the anus and the labia should be scrubbed with soap and water. I consider it safer to clip the hair with scissors than to use a razor. The uneven surface makes the nicking of the skin by a razor an accident very liable to happen, thereby adding an extra avenue of invasion of sepsis. The examining hands should also be as thoroughly scrubbed as if you were about to enter the abdominal cavity. It is not my custom to use gloves in this first examination, and as far as the mother is concerned I do not consider it necessary if it is early in labor; but, as far as you yourself are concerned, the use of gloves is always a protection. The labia should be separated by the fingers of the left hand and the examining finger introduced without touching anything but mucous membrane. This examination will reveal whether or not the cervix has been taken up and to what extent dilatation has progressed, and probably will help to confirm the diagnosis of position as made by the external palpation.

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* Read at a meeting of the Franklin District Medical Society on July 10, 1917.

During the first stage, if your patient is calm and unruffled, it is unnecessary, of course, to be with her constantly, but in many instances the presence of a physician, in whom she has faith and confidence, will do more than anything else to make this stage easier. It is during this period that it is not only proper but advisable to use some form of drug to quiet the nagging suffering which the pains of the first stage cause. If the os is tight and slow in dilating, chloral hydrate per rectum in 15 or 20 grain doses, repeated in three hours, is often of great value, and morphia with atropia is undoubtedly a drug to be used in many cases at this time, to allow the patient to get rest and not become exhausted by the wearing nervous strain of the repeated and long-continued suffering.

There is no distinct line of demarcation between the first and second stages, of course, and yet it may often be determined by the way in which your patient works. The pains, although more severe, seem to be more easily borne, as they are accompanied by the voluntary efforts of the mother to supplement the uterine contraction. During the first stage I let the mother do what she pleases in regard to position, either in or out of bed, on her back or side, but when the expulsive pains of the second stage begin, I wish her in bed, and in such position that I may give her the assistance that may be helpful to her in the later stages.

Of course the rectum was emptied by enema at the time the patient was being prepared for the first examination. The position in bed which the patient should occupy for delivery will vary in the practice of each of us individually. Personally, I prefer my patient lying on her left side with the hips near the edge of the bed. I feel that I can control the progress of the head over the perineum better in this position, and also more easily watch the whole of the latter part of the second stage. During the second stage, especially after the head has got well down into the cavity of the pelvis, I believe it is our duty, unless the patient objects, which occasionally she does, to give something to relieve the severe suffering. Whether it is chloroform, ether or nitrous oxide will depend upon the practice of the individual man, but it is wrong to let a woman suffer needlessly, and if the anesthetic is used only with the pain, and discontinued as soon as the severity of the pain is passed, it will not interfere with, or retard, the progress of the labor, but will dull the sensitiveness of the mother to the pain which she is bearing, and help her to use her voluntary muscular force. Unless instructed, few women know how to use their muscles to best advantage in aiding the involuntary uterine contraction. Explain to your patient the advantage of holding her breath and bearing down when her pains become severe, and then relaxing completely when the climax of the pain is passed. Pressing the feet against the footboard and at the same time pulling on a sheet fastened to the foot of the bed, or an assistant's hands, is helpful to many patients in using their muscular power to the greatest advantage. Don't forget there is a certain amount of motion in the sacroiliac junction. Pressure over the coccyx will throw back the promontory of the sacrum and thereby enlarge the inlet to the pelvis and aid the descent of the head into the pelvic cavity. Also later you can enlarge the outlet by reversing the process and pressing on the lumbar sacral region, thereby throwing back the coccyx. Oftentimes this is of great advantage. As the head descends still farther into the pelvis and begins to distend the perineum, we must watch the progress carefully, in order to do everything in our power to avoid such rapid dilatation as to cause a rupture. This can be accomplished in two ways,—either by overcoming the outward pressure by our physical efforts of holding back the head, or by using the anesthetic to such a degree that the expulsive efforts are decreased. I generally combine the two. As the head advances, I press it forward towards the perineum, until the occiput (I am considering the most common position,—occiput left anterior) has passed by the symphysis pubes, and then press it backward, bringing the symphysis in the hollow of the neck, and so gaining that extra amount of room, holding the head back with the pain, and allowing it to slowly slip forward between the pains, depriving the mother of everything that she has previously had to pull upon, and if the pains are extremely hard, and she cannot overcome the tendency to bear down with the pain, I force the anesthetic to surgical anesthesia, until after the chin has slipped over the perineal body. Another little point which I have found of value is: just before the nose and chin are born, if you rotate the head a little, so that these points come one side slightly, rather than in the middle, there is less likelihood of a tear resulting, if you have avoided one up to this time. After the head has been born, wipe out the eyes, nose and mouth with boric acid solution. Feel if the cord is around the neck. If it is, if possible, by gentle traction, free it by slipping it over the head. If this is difficult, and there is good pulsation, leave it alone. The delivery of the shoulders and arms will at times require some help, and at others is accomplished so rapidly that you are unable to do anything even to retard it. Whether the perineal or pubic arm should be brought down first, is unimportant. Both shoulders should not be allowed to be born together because it would tend to make undue pressure upon the perineum. After the child is born, the nurse or attendant should grasp the uterus with the four fingers behind and the thumb in front of the uterine body, pressing downward and backward to prevent its ballooning up from a relaxing of the muscles. As soon as the baby is born, grasp it by its feet and hold it up, the head hanging down. Drain it, wiping out the mouth at the same time with the cotton and the boric acid solution. Cover the child up warmly if it is breathing well, and wait until pulsation ceases in the cord before tying it. After tying the cord and cutting it, assure yourself by actual observation that there is no leaking from the fetal stump before allowing the child to be taken away and wrapped up in a warm blanket.

Now, while you are waiting for the third stage, you can determine by observation whether or not there is any tear of the perineum, either of the mucous membrane or mucous membrane muscle and skin, and if the tear is only a slight one, it may be repaired at this time while waiting for the birth of the placenta. I have some one constantly holding the uterus from the time the child is born until some half or three-quarters of an hour after the completion of the third stage. Wait at least fifteen or twenty minutes after the birth of the child before using any efforts to expel the placenta. If the mother has not succeeded in pressing it out before this time, then you may grasp the uterus yourself and bear down, squeezing the placenta out, the nurse or attendant again taking that organ as your pressure is given up. The danger of possible infection and contamination is all the greater at this period; after the birth of the child the avenues of absorption are so much more freely opened. Therefore, if your hands or gloves have become contaminated, again cleanse them before delivering the placenta. As the placenta appears at the vulva orifice, grasp it and twist it slowly as it is being born, that the membranes may be twisted into a cord and delivered intact. If they do not come away freely, put an artery clamp on the part delivered, cut it away from the placenta and twist the clamp, making slight traction, allowing the nurse to let up on the pressure on the uterus at the same time, in this way favoring the free separation and complete discharge of all membranous tissue, but if some part is torn off, as determined by an examination of the palcenta and membranes, and left within the uterus, don't go after it; leave it alone and it will be discharged with the lochia in a relatively short time with very much less danger to the mother than if efforts were made to secure it at once.

I have omitted so far to say anything about the use of extract from the pituitary body. Pituitrin has an important place in obstetrics, and is a most valuable adjunct to the accoucheur, but there is great danger of its being abused. Its function is to increase the force of the contractions of the uterine muscle when injected subcutaneously. I firmly believe that we never should use pituitrin unless we know that there is no obstruction in the pelvic canal, that the os is at least two-thirds dilated, and that the fetus is in a normal position, and that the only reason for delay in birth is lack of muscular expulsive power. Under these conditions pituitrin administered subcutaneously in the arm, in doses of ½ cc., is a wonderfully valuable agent, shortening the length of labor materially, and thereby lessening the suffering of the mother. I always control the action of pituitrin by my anesthetic, if it apparently is exerting too great a pressure. The danger is of a rupture of the uterus from this excessive muscular contraction, and this is the reason that a rigid os, a contracted pelvis and a mal-position are contraindications which render its use even dangerous. This applies equally to its use for inducing labor or clearing up an abortion.

Again, I have not referred to twilight sleep, being convinced that the use of morphine and scopolamin in sufficient quantities to dull the sensibilities of the mother sufficiently to make her forgetful of suffering, is a danger to mother and child, and has no advantage that is not met by the ordinary method of conducting labor with morphine in the preliminary stage, and an anesthetic and pituitrin during the secondary stage.

Watch your fetal heart during the whole process of labor, listening to it as often as once an hour. An increase in frequency of the fetal heart beat or a weakening of its force are necessary indications for hurrying up the birth. An increase in frequency of the mother's pulse is an indication of failure of her strength, which must be met in the same way.

Often I only insert my finger into the vagina at my preliminary visit, to determine the condition of the os. If I wish to assure myself of the descent of the head into the pelvis, I make a rectal examination. The less you expose your patient to the dangers of infection by frequent vaginal examinations, the freer from blame your mind will be if infection should occur.

Finally, the most important function of the accoucheur in a normal case is to render his patient mental support and encouragement. I believe we often fail to realize how much this means to our patients. Help nature, be ready to meet emergencies if they arise, but be careful not to interfere needlessly. Don't try to hurry up the delivery to save your own time.

Book Reviews.

The Growth of Medicine from the Earliest Times to About 1800. By Albert H. Buck, B.A., M.D. New Haven: Yale University Press. 1917.

This volume is the first work published on the Williams Memorial Publication Fund, a foundation established on June 15, 1916, by a gift made to Yale University by Dr. George C. F. Williams of Hartford, in memory of his grandfather, William Chauncy Williams, and of his father, William Cook Williams. These three generations were all graduates of the Yale Medical School in 1822, 1850 and 1878, respectively. Dr. Buck's work is a careful and scholarly history of the development of medicine and is divided into three parts. The first, dealing with ancient medicine, is concerned with the remote Oriental origins of medicine, its growth at the dawn of history in Greece and its later evolution in the Greek and Roman world. The second part, dealing with medieval medicine, begins with the Byzantine period in the early Middle Ages, describes the Arabic renaissance and the progress of medicine in Europe during the epoch of the Crusades. The third part, dealing with medicine during the Italian renaissance, summarizes the origins of modern medicine in anatomy, chemistry, and the clinical sciences, and brings the story of the development of medicine and surgery nearly to the close of the pre-anesthetic period. The work is illustrated with twenty-eight well-chosen plates, illustrative of epochal periods, and closes with a general index and with a list of more important authorities consulted, from Aristotle to the present time. The work is a valuable and delightfully written contribution to the science of medical history.

Clinical Gynecology. By James C. Wood, A.M., M.D., F.A.C.S., etc. Philadelphia: Boericke & Tafel. 1917.

This is a series of clinical lectures on gynecological topics, nearly all of which are "borderline subjects," and therefore of interest to the internist as well as to the surgeon. The so-called conservative point of view as regards operation, characteristic of most homeopathists, is in evidence. Many points of practical value are to be noted in the commentary, while other considerations are necessarily limited in talks of this sort. There are, under each heading, homeopathic therapeutics, giving indications and remedies.

The foreword, a brief apologia, is of more general interest. Hahnemann should be judged by the medical standards of his own day in order that what he did and represented may be appreciated more nearly at its true worth. There is considerable misunderstanding, even on the part of homeopathists, of Hahnemann's contributions to the progress of scientific medicine.

Cornell University Medical College. Studies from the Department of Physiology. No. 5. New York: Cornell University. 1917.

This volume contains the fifth of a series of studies from the Cornell Department of Physiology. It is divided into two parts: the first, containing thirteen studies from the Department of Physiology; the second, consisting of a dozen communications from the Russell Sage Institute of Pathology. The latter are wholly devoted to the subject of clinical calorimetry. The papers are well illustrated with charts and tables and constitute a useful contribution to physiological and pathological science.

The Influence of Joy. By George Van Ness Dearborn. Boston: Little, Brown & Co. 1916.

This little book is written for popular use, and the writer, who is a well-known physiologist, takes up in an interesting way the influence of joy upon the bodily functions, a relationship which lately has been much studied by physiologists, particularly Cannon. It must not be forgotten, however, that joy is only one of the emotions which influence the autonomic division of the nervous system; and important as we have learned the influence of joy to be upon the functions of the body, as, for example, the digestion, muscle tone, circulation, and other organic functions, it should not be forgotten that the broad relation of the whole mental and social life of the individual is more than this one aspect, and that "pollyannaism" should not be carried too far into the field of physiology or medicine.

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RE-EDUCATION OF THE WAR CRIPPLE.

THE notion that the cripple is a helpless member of society and is to be pitied and maintained in idleness at the public cost, is gradually giving place to a more rational conception that he may be fitted for some occupation by which he may become self-supporting and self-respecting. During the past two decades there has been a marked increase in the number of industrial employees who have been crippled by accidents, especially in the period before the advent of the safety propaganda; and the study of the results obtained in the treatment of these cripples, and of those from the armies in Europe since 1914, has put us in a position to treat more intelligently the war cripples who are soon to come to us from the battlefields of France.

The subject has been treated most understandingly in a recent pamphlet by Douglas C. McMurtrie, editor of the *American Journal of Care of Cripples.** Germany was the first country to take an intelligent interest in the industrial cripples and the first to act in preparation to treat the cripples of the present war, the national association in the interest of the deformed issuing a call to its members eight days after the outbreak of hostilities. France soon followed when the mayor of Lyons organized in that city a municipal training school for the *mutilés de la guerre.* In England the Incorporated Soldiers and Sailors Help Society—founded after the South African war—extended its activities. In Canada a federal commission began at once the establishment of convalescent homes and training classes, and now the work has reached large proportions, and the results are surprisingly satisfactory. Italy and Russia made provision for their cripples during the early months of the war. It is America's turn now. The Surgeon General of the Army has organized a department of military orthopedics, and Major Joel E. Goldthwait, M.R.C., of Boston, director of military orthopedics for the expeditionary forces, has returned recently from a tour of inspection of French and English orthopedic hospitals, bringing the experience of those countries in re-education work.

The economic rehabilitation of men disabled in war is a matter of such vital moment, not only to the individual, but also to the state, that the problem merits a most careful study. The psychology of the recently crippled soldier must first be considered. He has been away from home a year or two—perhaps longer—and the military organization has relieved him of the routine responsibilities of the civilian; all the necessities of life have been provided automatically; after his injury he has been cared for by the medical corps and the Red Cross, possibly by grateful civilians as well. Thus his initiative and sense of responsibility are deadened, his handicap, in the shape of the loss of a hand or a leg, is a severe discouragment, and the only bright feature in prospect is a prospective pension. On getting home, no one seems to have any use for a cripple. The question that occupies his mind is apt to be how he can arrange his life in order to live on his pension. Ability to work might invalidate the pension. Therefore, why go through the difficult stages of trying to learn a new ocupation, only to have the small means of support made even smaller? In both France and Germany, the re-education of the war cripples was much retarded by this spirit, many men being unwilling to undertake training—a voluntary matter, of course—and it was overcome by a statement from the government that the amount of the pension would be based, not on earning power, but on the degree of physical disability.

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* "The War Cripple." Columbia University, New York, 1917.

First, the state of mind must be looked into and the patient must have his initiative reawakened and his ambition strengthened with his returning health and strength. Then comes the choice of trades—a most difficult matter. Some times it is better for the disabled man to enter a different trade from the one he followed previous to his injury, even though he can manage to do the work. If an industry is on the wane or if it is a seasonal trade, in which, when orders are slack, the less skilled workmen or those not able to work full time are liable to lose their places, it is wise not to advise the cripple to enter it. A large variety of trades is being taught to the war cripples abroad and it is not necessary to enumerate them here. The important point in fitting the man to the job is to look ahead and not get him into a place where the wages are abnormally high during favorable times—as in making war munitions—because of the great danger that he will be laid off or discouraged on the return of normal conditions. Training, if begun, should be thorough, and enough time given to it; and authorities agree that it is inadvisable to train a man for an occupation he can pursue only by the use of special apparatus, such as special treadles for a lathe or special shifting mechanism for a typewriter.

The attitude of the public toward the returned soldier will do much to make or mar the success of work with war cripples. He should have the whole-hearted gratitude and respect of the community, but he should not be spoiled or pampered, as exemplified in "patriotic hysteria" or "indiscriminate treating." In the past there was difficulty in supporting the cripple during his course of training. The state now undertakes this and supplies artificial limbs, where necessary. It has been found that often cripples discard a complicated and expensive prosthetic artificial limb for daily use and, in the case of a false leg, use the "peg and bucket" leg, reserving the more elegant leg for Sundays and holidays. To avoid discouragement it is well to bear in mind that a stump shrinks after amputation, and it is not advisable to fit a permanent leg until after this shrinking has taken place; also, that the life of an artificial limb is limited and that, eventually, it will need renewing, entailing further expense.

Effective placement of the war cripple requires much experience and should not be handled in an opportunist manner. Disabled soldiers should be regarded as a special class in the community, and the transition from a military to a civilian life directed with the greatest skill and patience, in order to do the best both for the individual and for the state. It is too broad a problem for physicians to solve unaided. To be brought to a successful issue it should have the coöperation of army surgeons, orthopedists, trade teachers, social workers, placement experts, representatives of labor and employers.

How much the state and how much private enterprise ought to be responsible for the support and direction of the after-care of the war cripple, is as yet a debatable question. Theoretically, the responsibility rests with the state, but the machinery of government generally works slowly, and if we may take the experience of Canada as an example, there is a large place for the patriotic public to help, especially in the early stages of the war.

AN OBSTETRIC NUMBER.

The issue of the Journal for March 30, 1916 (Vol. clxxiv, No. 13), was published as a special obstetric number, dealing with two of the important modern problems in obstetrics, namely, Caesarean section and obstetric anesthesia. The present issue of the Journal is also published as an obstetric number, devoted largely to two other important problems of obstetric complication,—hemorrhage and cardiac disease.

The subject of obstetric hemorrhage is dealt with from slightly differing points of view by Dr. De Normandie and Dr. Titus, the latter restricting his consideration to hemorrhage complicating pregnancy. Dr. Kellogg's paper, on chronic valvular heart disease in pregnancy and labor, presents an elaborate clinical and statistic study of the various conditions bearing upon this subject. He arrives at a series of carefully considered conclusions, and summarizes, in convenient tabular form, his choice of method of treatment at differing stages of pregnancy and degrees of compensation or decompensation. Not all will agree in full with these conclusions, but the paper deserves attentive study as a valuable and thoughtful summary and codification of the present knowledge and practice of treatment in this important group of cases.

Dr. Cochrane's paper presents a continuation of the consideration of Caesarean section in our first obstetric number. Dr. Twitchell's paper on the management of labor is a convenient and compact summary of general obstetric practice.

The particular attention of readers is directed to this number, which it is believed will be found of interest and profit, not merely to obstetric specialists, but as well to the general practitioners of medicine, by whom so large a proportion of the obstetric work is done in most communities.

MEDICAL NOTES.

Mortality of Mothers in Childbirth.—More than two and three-quarter million women of child-bearing age, namely, between 15 and 44 years, are policy holders in the industrial department of the Metropolitan Life Insurance Company. The largest number of them are wives and mothers. Among these women, 1,769 deaths occurred during the year 1916 from diseases and conditions incident to childbirth. The statistics of these deaths, which are particularly complete and accurate, will be of interest to the medical profession, to health and social workers, and to the general public.

It is very gratifying to report a continued decrease in the death rate in the year 1916 from the causes associated with childbirth. The number of deaths was 70.1 per hundred thousand white female policyholders, ages 15 to 44, in 1911, and 62.6 per hundred thousand in 1916; which is a decrease of 10.7%. Among colored women of the same ages, the rate was 88.4 per hundred thousand in 1911 and was reduced to 70.4 per hundred thousand in 1916—a drop of 20.4%. In other words, the general conditions of mortality from the puerperal causes were practically the same among colored women in 1916 as among white women only six years earlier.

Childbirth fever or puerperal septicemia was the most important of the particular diseases and conditions responsible for this maternal mortality. This single cause of death was responsible for 41% of the total deaths from puerperal conditions. Albuminuria and convulsions, associated with child-bearing, were responsible for 29%, and the accidents of labor for 10%. Accidents of pregnancy, chiefly abortions and miscarriages, caused 8% of the total, as did also puerperal hemorrhage.

Serum for Snake Bites.—There is being produced at the Seropathic Institute in Butantan, Brazil, a new antivenomous serum or antivenene which is efficacious against the bites of snakes, scorpions and venomous reptiles. The process of preparation of the poison is as follows: A solution in salt water is made of dried cobra, rattlesnake and viper venom, which is so fatal that a dose of one-sixtieth of a grain per pound of rabbit would kill the creature in twenty minutes. The final elaboration of the polyvalent serum is the result of years of work at the Pasteur Institutes in Paris, Algiers and Kassauli, India. In the final process a horse is inoculated with 0.05 of a milligramme of dried cobra, viper and rattlesnake venom. After a short period the blood reacts to the stimulation of the poison and acquires a certain measure of immunity. Additional doses are given until, in about three months, the horse is able to endure a dose fifty times the lethal strength. Its blood has then acquired an immunity so great that an injection of three ounces of serum prepared from it is sufficient to cure a man suffering from the bite of a deadly reptile.

Fund for Cancer Research.—By the will of the late Julian A. Heltman of New York, the Mt. Sinai Hospital is the recipient of a bequest of $100,000 to be used in research work in the hope of discovering a cure for cancer.

American Hospital Association.—The nineteenth annual convention of the American Hospital Association was held in Cleveland, Ohio, from September 11th to the 14th, inclusive. Among the speakers were representatives of the Red Cross, the office of the Surgeon General, the medical section of the National Defense Council and the League to Enforce Peace.

Poliomyelitis Organism Confirmed.—Announcement is made that the efforts of Drs. George D. Heist, Myer Solis Cohen and John A. Kolmer at the laboratories of the Jewish Hospital at Philadelphia, have resulted in isolating the poliomyelitis germ and in confirming the investigations made at the Rockefeller Institute by Dr. Simon Flexner. The work was done in the Mastbaum Research Laboratory, which was established at the Jewish Hospital by Jules E. Mastbaum after the epidemic of 1916, and in the McManes laboratory of experimental pathology of the University of Pennsylvania.

Suicide Mortality among Wage Earners in the United States.—The Metropolitan Life Insurance Company has recently completed a study of suicide as a cause of death among the industrial policy-holders of the company. According to this study, there has been a marked decrease in the death rate from suicide during the last few years. Among four million insured white males the number of suicides in 1916 was 620, or 15.3 per 100,000. In 1915, the rate was 19.6

per 100,000. The most frequent form of suicide among these white males was by firearms (31%). Among nearly five million white female policyholders, there were 308 suicides in 1916, or 6.3 deaths per 100,000 insured. In 1915, the rate was 7.5 per 100,000. Poisoning was the most usual method of suicide among the white females —more than one-third having been so accomplished.

The death rate from suicide among negro males is a little over one-half as high as among white males. In 1916, the rate was 8.2 per 100,000 insured. Negro females show the very lowest rates of any of the groups studied. The rate was 3.4 per 100,000 in 1916, the total number of suicides being only 22 among over 650,000 insured colored women.

The figures show that suicide is more than twice as frequent as a cause of death among males than among females. This is true at all periods of life except at the ages 15 to 19. It is remarkable that the change from youth to adult life should disturb the mental life of females so much more than that of males. The same conditions are found to prevail among the white and the colored races. After early adolescence, the white female suicide rate remains practically stationary, never varying very much from about 11 per 100,000. On the other hand, the white male suicide rate increases with each age period. The rate is highest at the ages 65 to 74, when it is over 80 per 100,000. Suicide is then a very common cause of death, nearly five times as prevalent as at the age period 20 to 24.

WAR NOTES.

Report of American Red Cross.—The war council of the American Red Cross has issued a detailed report of its expenditures since war with Germany was declared. It states that $12,000,000 will have been expended for war relief in the first six months. More than $10,000,000 of this sum is being expended for the benefit of France. Other countries receiving relief are Russia, Roumania, Italy, Serbia, England and Armenia. The war council has sent to Europe five separate commissions, each composed of representative Americans skilled in business administration, in medical and surgical work, and in other lines. In France the Red Cross has assumed management of the war relief clearing house, the administration of the American Ambulance Hospital at Neuilly and the support of Dr. J. A. Blake's American Hospital in Paris. It has allied with itself the American Surgical Dressings Committee which distributed in France in July 782,949 dressings among 435 hospitals. As for the American Army and Navy, the Red Cross is establishing field canteens for every corps of the Army, including the French Army. The war council regards it as an obligation to have available at all times a sufficient portion of its funds to enable it to perform any relief or emergency service for our own soldiers and sailors that may be needed.

Opportunity for Medical Women.—It is interesting to note in a recent report of the venerable Queen Charlotte's Lying-in Hospital, London, that women as well as men are eligible to appointment to the medical staff of the hospital and that the resident medical posts during the past year have been filled by women. This change of custom has been forced by reason of the heavy demand of the army on medical men. The hospital is also devoting its energies, as never before, to saving the children in order to offset, as far as possible, the ravages of war.

Ambulances for Russia.—The American Red Cross is sending to Russia a shipment of one hundred twenty-five motor ambulances and automobiles for use behind the lines. Russia is sorely in need of vehicles of transportation for the wounded, there being only 6000 on the Eastern front, while in France, a line only one-third as long, there are 75,000 ambulances. The automobiles being shipped will equip one army corps with five complete ambulance sections. They will be received by the Red Cross mission sent to Russia two months ago under Dr. Frank Billings, but will be turned over to the Russian Army to operate.

Conscription of Medical Men.—The lack of doctors to fill the medical corps of the army is a matter of much concern to the War Department. Twenty-four thousand physicians are needed to conduct in a proper manner the medical departments of the Army, and up to the present time less than fourteen thousand are thus engaged. According to Major Codman of the United States Army, who has been conducting a campaign for medical recruits in Maine, the Surgeon-General has under contemplation the plan of conscripting doctors between the ages of 21 and 31, until the necessary number is acquired.

Appointment to General Pershing's Medical Staff.—It is reported that Dr. Eugene S. Belisle of Worcester, Mass., a graduate of Clark College in 1912, has been appointed to the Medical Corps of General Pershing's force in France, with the rank of lieutenant. Dr. Belisle took up the study of medicine at Montpellier, France, and later served as interne at several French hospitals. He was sent by the French Government to the High Alps Department to combat an epidemic of typhoid that was raging in five cities and towns. His uncle, Eugene L. Belisle, is Unted States consul at Limoges, France.

The Deaconess Hospital at Concord, Mass., has offered to the Government the service of fifteen beds to supplement the fifty beds available for wounded soldiers at the Boston Deaconess Hospital. The offer has been accepted by the Government.

Commission on Social Insurance.—The Commission on Social Insurance of the Commonwealth of Massachusetts, appointed under Chapter 130 of the Resolves of 1917, will give a special hearing for physicians at the State House, Room 481, on Wednesday of next week, Sept. 26th, at 10.30 a. m. Among the more important questions to be taken up at this hearing are:

1. Shall the State insure its citizen wage-earners? If so,

2. What is the best scheme of insurance?

3. Is the cost of medical care and attention beyond the reach of the ordinary workingman today.

4. To what extent are wage-earners able to avail themselves of free clinics in the State?

5. How can the State aid further in extending the work of preventive medicine?

It is hoped that a sufficient number of physicians will be present to ensure a lively, intelligent, and profitable discussion.

War Relief Funds.—On Sept. 14, the totals of the principal New England War relief funds reached the following amounts:

French Wounded Fund	$252,306.82
Armenian Fund	226,841.08
Surgical Dressings Fund	122,814.85
French Orphanage Fund	120,668.10
Polish Fund	85,322.16

BOSTON AND MASSACHUSETTS.

The Week's Death Rate in Boston.—During the week ending Sept. 8, 1917, the number of deaths reported was 230 against 232 last year, with a rate of 15.53 against 15.91 last year. There were 66 deaths under one year of age, against 53 last year.

The number of cases of principal reportable diseases were: diphtheria, 48; scarlet fever, 9; measles, 13; whooping cough, 18; typhoid fever, 13; tuberculosis, 45.

Included in the above were the following cases of non-residents: diphtheria, 3; scarlet fever, 5; typhoid fever, 5; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 6; measles, 2; whooping cough, 3; typhoid fever, 3; tuberculosis, 22.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 2.

Springfield Academy of Medicine.—The first meeting of the year was held in the new rooms at 137½ State Street, on Tuesday evening, September 11. An address was made by Dr Haven Emerson, Commissioner of Health, New York City.

Dr. L. D. Chapin, Secretary.

Water Supply for Belchertown.—The state has at last succeeded in finding a satisfactory source of water supply near Belchertown, where the proposed school for mental defectives or feeble-minded is to be located.

The Admittance of Women to Harvard Medical School.—The innovation of admitting women to Harvard Medical School is under advisement. Conditions brought about by the war, the calling of prospective medical students to the army, and the increasing demand for doctors may result in Harvard Medical School following the custom of Johns Hopkins Medical School and admitting women to its courses. While women have been admitted to post-graduate courses and have received degrees for work done therein, the degrees have been conferred by Radcliffe, the corporation of Harvard University not conferring degrees upon women, and it is by this means that women may enter the regular classes of the Medical School.

Appointment to Boston Health Department.—Announcement is made of the appointment of Dr. M. Victor Safford of the United States Public Health Service to the position of epidemiologist in the Boston Health Department. Dr. Safford is well known in Boston as head of the medical department of the immigration station in Boston Harbor, which position he has held since 1902, when he was sent here by the Government to organize the immigration work at this port. Dr. Safford is a graduate of Bowdoin Medical School and has been connected with various New York hospitals. In 1896 he was appointed surgeon at the Ellis Island Immigration Station and arranged on its present plan the system of inspection of immigrants. He was a member of the committee which devised the present system of statistics on immigration. During the past summer he has been on duty at the military cantonment at Columbia, S. C. A desire to settle in Boston permanently has induced Dr. Safford to leave government service.

Child Conservation.—The Department of Health of Massachusetts has appointed a committee and has organized a campaign to stimulate child conservation in this state. To this end Dr. A. J. McLaughlin called a meeting at the State House, attended by over a hundred people, and outlined the plans of the committee. He stated that the Department believed its efforts at saving lives of babies should take into account the extra-departmental agencies and these should be shown what they can do to coöperate with the Department towards making an intensive and comprehensive effort. The committee consists of Dr. David L. Edsall, chairman, Dr. William J. Gallivan, Dr. Lyman A. Jones, Dr. Fritz B. Talbot, Mrs. William H. Lothrop, Mrs. Nathaniel Thayer, Dr. Walter Fernald, William Healey, Miss Mary Beard and Dr. Robert L. De Normandie.

The Massachusetts Medical Society.

STATED MEETING OF THE COUNCIL.—There will be a stated meeting of the Council of the Massachusetts Medical Society on Wednesday, October 3, 1917, at 12 o'clock, noon, at John Ware Hall, Boston Medical Library, 8 The Fenway.

W. L. BURRAGE, *Secretary.*

NOTES FROM THE DISTRICT SOCIETIES.

DISTRICT CORRESPONDENTS.

Berkshire, A. P. MERRILL, M.D., Pittsfield.
Bristol North, ARTHUR R. CRANDELL, M.D., Taunton.
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.
Essex North, T. N. STONE, M.D., Haverhill.
Essex South, H. P. BENNETT, M.D., Lynn.
Hampden, LAURENCE D. CHAPIN, M.D., Springfield.
Hampshire, E. E. THOMAS, M.D., Northampton.

WORCESTER DISTRICT MEDICAL SOCIETY.—A regular meeting was held Wednesday, September 12, 1917, at G. A. R. Hall, Worcester, Mass.

Dr. John Bapst Blake of Boston, Mass., addressed the Society on "Some Medical Aspects of the War."

There are serving with the colors the following men from the Society:

With the Army: Dr. Joseph O'Connor, Dr. Howard Beal, Dr. Edw. B. Bigelow, Dr. Frank W. George, Dr. Roger Kinnicutt, Dr. E. B. Simmons, Dr. William E. Denning, Dr. Willard Lemaire, Dr. James J. Goodwin, Dr. Chester C. Beckley, Dr. Roger Schofield, Dr. Merrick Lincoln, Dr. George Lincoln, Dr. Edw. H. MacKay, Dr. E. S. Phelan, Dr. R. S. Newton, Dr. William J. Fay, Dr. A. K. Yoosuf.

With the Navy: Dr. Louis Johnson, Dr. Joseph Lannois.

With the English Army: Dr. Kendall Emerson, Dr. Oliver Stansfield.

The Medical War Committee invites information to supplement or correct this list. Doctors joining the colors should notify the committee and indicate their wishes with regard to sharing the fees derived from their patients.

ERNEST L. HUNT, *Secretary.*

BRISTOL NORTH DISTRICT MEDICAL SOCIETY.—The fall meeting of this district will be held at The Tavern, Mansfield, Thursday, September 20, at 1.30 P.M. Dr. Lyman Asa Jones will be the principal speaker of the afternoon.

Dr. Ralph P. Dean has been appointed a visiting physician to Morton Hospital, Taunton.

The following have enrolled in the Medical Reserve Corps: A. J. McGraw, J. L. Murphy, Taunton; B. M. Latham, Mansfield, all now at Fort Benjamin Harrison. W. F. Milot, P. J. O'Dea, Attleboro; E. S. Ward, North Attleboro; J. B. Sayles, Taunton.

ARTHUR R. CRANDELL, M.D.,
District Correspondent.

HAMPSHIRE AND FRANKLIN MEDICAL SOCIETIES.—A joint meeting of the Hampshire and Franklin Medical Societies was held on Thursday, September 13, at 3.45 P.M., at Hotel Draper, Northampton. Dr. J. T. Bottomley addressed the meeting on "Control of Cancer."

Supper was served, and the rooms of the Northampton Club were open to members of the Societies.

DR. F. A. MILLETT, *Secretary.*

CONFERENCE OF THE SPECIAL COMMISSION ON SOCIAL INSURANCE, AT THE STATE HOUSE, AUG. 15, 1917.

MR. FRANK F. DRESSER of Worcester, counsel for the American Steel and Wire Co., addressed the Commission, and the following notes were taken:

My own interest in Health Insurance came about in this way, and I will take the liberty of stating it because I find a good many people have been through the same experience. When the "Doten bill" was first proposed in the Legislature, about two years ago, I was required to know about it, and did look into it as well as I could in a very short time, and I objected to the bill on more or less superficial grounds, I guess. After that, I was asked by one of the trade associations to talk to them about the general subject, and that required some study, so I spent a good deal of last summer in trying to find out about it.

After I had gone into the matter a little way, I began to think it a wise proposal, a pretty good thing, and then I tried to apply it as a practical matter to the people it would have to deal with and to our industries; but the minute you got away from theoretical end and tried to tie it right down to your counting-room and the men you had to deal with, it looked very different; not only in cost, which I of course realize is very great, but in the ease or the possibility of handling it. Then it seemed to me worth while to see if it were possible to work out some scheme which would reach the results, or approximate the results, and fit in a little better with our conditions. I attempted that and outlined it a little bit to this trade association, who thought there might be something in it, and committees were appointed; various suggestions were made and beaten into shape and suggested to the conference in Washington.

The first point that struck me on the general proposition was this: Of course, it is desirable to prevent illness. We try to do that now, and that has got to continue; and of course we know that people of small resources, the poverty-stricken or by no means well-to-do, have a greater incidence of illness than those who are better off, due to living conditions, etc., and it is desirable and *highly* desirable to work out some scheme to help them. However, the bill and the foreign bills which that followed do not reach more than a fraction of the persons whom you need to reach; it reaches only the person who gets a job and holds it. Now, that person has resources. But the person who is old and can no longer work, the person who is incompetent and can't work, the person who is alcoholic or what not and can't hold a job, isn't taken care of; and he isn't taken care of anywhere in England, in Germany, or anywhere else. Nor is there any practical way outlined in any of these suggestions, that I am aware of, that reaches the person who is self-employed and is carrying his own weight. It doesn't reach the home worker, the journeyman, the little shop-keeper, the little farmer, persons who are in the same financial stratum, and yet, because they aren't employed, and because there is no way of gripping them personally and compelling them to do something, aren't taken care of. It leaves out a class that ought to have the benefits, such as they are, of this statute,—the thousands of people who are running their own business and are getting very little out of it. And it does not take care of the paupers or derelicts, who are now being taken care of.

The fact that it leaves out those classes of people is a serious defect, and it has the secondary result that those very classes have to pay the cost; they don't get the benefit and do pay the cost, to a certain degree. Whatever contribution there is from the state or the city as an employer, or the state as a contributor, reaches those people to a certain degree; the rent has to bear a portion of that tax, and commodities a portion. The employer cannot shift much of the tax from himself because he is in competition with others; if his business is confined to Massachusetts, he can shift a good deal but he cannot if his business extends outside the state. There, however, is enough of the actual cost of the proposal which reaches the people who are not benefited by it but are contributing to it, so that it is not wise. You don't want to compel the person on the poverty line to bear a new burden, especially when he is not getting the benefit.

Is there any way that can reach them, and what do you want to reach? You want, first, to make your living conditions better, whether they are living conditions in a tenement or living conditions in a mill. That is undoubted; and that is being done. The figures the last two years in New York and Massachusetts are extraordinary in the diminution of the death-rate; and the diminution in the death-rate, too, is showing more progress in the cities than in the country towns. City life is healthier than country because of the sewers and water supply, the greater care and the knowledge of hygiene which gets scattered through the city schools and does not reach the country children.

The other thing is that none of these people, whether they are employed or unemployed, whether they live in the city or in the country, whether they are well-to-do or not, get anywhere near the standard of medical care that ought to be given. The doctors themselves say that very frankly, and that is one of the great arguments for this sort of legislation. In some way the standard of medical service should be raised and brought closer to the people. It is true that the hospitals give it, and if a man is rich, he can buy it; but most of us who can't afford specialists and aren't charity cases are not apt to get it, and if that could be brought about it would be a desirable thing.

Now, it struck me,—and I find that it seems not to be impracticable to many doctors with whom I have talked,—that some plan might be devised to organize the medical profession. It is an absolutely disorganized profession now—more disorganized than the legal profession. Every man starts out on his own hook and there is no co-operation or grouping of the different lines of knowledge that may have to focus on any particular illness, outside of a hospital. There is one way that may be possible, but it is a pretty radical way; however, it is a *possible* way.

We might establish throughout the State diagnostic stations or clinics, or dispensaries, if you prefer to call them so, each station being the centre of a definitely defined district and having its own staff of physicians, surgeons and consultants. All doctors should be required to be attached to the staff of one or another of these stations, the doctor selecting the one with which he wishes to be allied, but his practice would not be confined to that district. He might practise wherever he pleased, with the obligation only of reporting any disease that he attended to the district station where it occurred. Thus there would be compiled data in each station of the diseases and disease districts of the community which would form a foundation for preventive work. These records should be properly guarded so that they would not be public. These stations, the management and regulation of them, should be under some authority, the State Board of Health, perhaps; and as all physicians should be required to be attached to the staffs, a physician not competent to be on the staff would not be permitted to practise anywhere, because, after all, the medical profession is a public profession and not a private business. It is an arm of the public health service and ought to be so considered and treated.

Each of these stations could serve a community of about 40,000 persons; thus, in Worcester, say, there might be four such stations, some of them connected with existing hospitals, perhaps, the others separate establishments.

The next thing would be, that these stations should be reasonably equipped with whatever is necessary to make proper diagnosis: Wassermann tests, urine tests, x-ray machines, etc. There should be a reasonably practical working library. They should have attached to them a pathologist who would have charge of the tests. Two men would be sufficient in a city like Worcester. Now a doctor with a case in the district of Station A will have there at his command, equipment and the means of knowledge that the chances are very great he has not in his own office. Because the illness is registered there and he is on the staff, there is a pretty strong inducement to avail himself of those things; thus, his case is likely to have a little better knowledge brought to its care.

Then the staffs of each station would do as a hospital staff does now: elect or appoint consultants; the eye man, the ear man, the surgeon for this, and the physician for that, who would go to the station at stated times and see there the cases that are brought in and referred to them by the attending physician. Whether I am rich or poor, my case is going to be recorded at that station. I know perfectly well that my physician is able to draw on any special knowledge for my particular illness. I can do one of two things: If I am willing to pay the price, I can have come to my house such specialists as my family physician thinks are necessary, and pay their bill. If I cannot pay the price, I can be taken to that station and have the advice there and pay a small fixed fee. I know I have to go at a certain time, but I can have the same specialized advice. (Referred to the Massachusetts General Hospital which has a clinic run on some such plan, where a fee of five dollars is paid.)

The result of such an arrangement, co-operative between family physician and specialist at a fee that could be paid, would be almost certainly, I think, an impulse to every physician to do his best work; it would create a sort of *esprit de corps.* A man couldn't stay on a station and loaf on his job or fail to avail himself of its facilities. He would be a marked man.

This doesn't mean getting free medical care to any degree; the man who goes there pays something for the advice of these specialists; he pays his doctor's bills, and there is no attempt to fix his doctor's fee; but it would mean a wider knowledge of the need of medical care, and the probability of getting better care.

Also at these stations it would be entirely possible to have one or two young doctors living there, to take care of the needy cases or of those who couldn't pay in that district. In all of our cities the Private District Nursing Association does excellent work; their headquarters could be at these stations. The well-to-do districts might need only one district nurse; the poorer might need a dozen. This could be done in towns in precisely the same way, although there might be fewer specialists there; yet we have scattered through the state now pretty comfortable hospitals, in many of these towns, which have attached to their staff some of our best men. The cost of this proposal would be considerable and I have tried to reckon it out. It is, of course, a pretty uncertain job; but in talking it over with some hospital people to find out what the stations would require for equipment and for building (assuming that the state couldn't rent a suitable place; it need not be large; it would have no beds or anything of that sort), I should estimate it would cost about one and a half million dollars to establish these stations. That seems a pretty large sum, but it covers the whole community. I feel fairly certain that that would perhaps be the outside, but it might be two million. It doesn't make much difference for the argument.

Then there would be the upkeep: the janitor, the pathologist, one or two salaried physicians who might be attached to the station for a year or two, and then set up for themselves; that would probably come to one or two million a year. But whether these are big sums or not, when you compare them with what any scheme of health insurance would cost the state, they are small. I believe the state was expected to contribute about seven million yearly for its share of the health insurance scheme. If it were four million or ten million, it does not make any difference; you can get this medical business for much less.

And in such a scheme, what are you getting? You are getting good medical attention for everybody in the commonwealth: rich or poor, employed or self-employed, or unemployed. It is simply extending the matter of guarding our public health a step further. There wouldn't be any objection to that from the public, I should suppose. How far there would be any objection from the doctors you can't tell. I talked to a lot of them last winter and opened up the subject a little bit, and twelve or fifteen came round afterward and said they thought it had the germs of success in it; it was what ought to happen. One man said, "I have been trying to work that out in a little town, and it is working out pretty well; all are working together." It does not seem to be entirely impractical from the physician's standpoint. I saw a good many different persons who were engaged in industrial work: heads of industrial departments, manufacturers or their representatives, and they felt it would be a desirable sort of thing from the mill standpoint. We are going to have, in a very few months, a considerable amount of data from this draft. It will be interesting to see the type of disabilities that it will show—slight defects probably; that is, the majority of defects can be taken care of: the teeth; ordinary rules of living; a lot of them are under weight because they aren't fed decently; they have enough food but don't get the right kind. Knowledge about these things will cure a good deal of that difficulty, hereafter, and having these stations right at your door, with a knowledge of what they can do through good district nurses, and their doctors, and the fact that every doctor is on the staff, will bring health home as being a practical thing.

Of course, this doesnt help the person who is sick, except in the matter of care. It isn't replacing any wages at all, and to a certain degree lost earnings should be replaced, if they can, on any sound insurance and social basis. Massachusetts is the only state which compensates for industrial diseases; there is not another state in the Union that does it. Most of the states that have a workmen's compensation act specifically exclude disease; those that don't have been construed to exclude it, with the exception of the Massachusetts Act. I think there are four states where the question has not arisen. So under our compensation law, as it stands today, and as it always will stand and always should stand, the employer is paying compensation for the disease which his employment or his industry causes. Now, I think that is entirely right; I doubt if the Court properly construed the intent of our Act, but the principle is sound. So far, then, as industrial disease is concerned, we have now insurance for the man who holds a job and gets sick at his job. That isn't a very great relief; it is, to some degree. There are now 26 or 30 diseases that it is agreed come from industry, but there are any number of diseases—the great majority of diseases—that have nothing to do with industry. When a man gets tuberculosis, it may be that he is living under conditions that may make him more susceptible to it; but if it is true that the conditions of his employment aggravate or accentuate a latent tuberculosis, then he gets his compensation today. But the majority of diseases we are liable to are not occupational diseases.

There is a fairly good way of reaching the employed men. The industrial physician has been in existence now for about six years. He can do more to get a workman well than anybody else. In a company in Worcester, every man is examined; he has a hernia, perhaps, or some defect that can be remedied readily; he is told about it and advised to have it remedied; and they very frequently do. Suppose a man comes in who is not a very rugged chap. They find out what his condition is and then say, perhaps, that he ought not to be subjected to the dust that is necessarily in some rooms; so they don't put him on that particular work, but put him somewhere else. The result is that the men are sent to the job they can handle with the least risk. If there is any doubt, the man is re-examined and shifted to another part of the works. Take a man with heart difficulty, for instance; there are a thousand things such a man can do, and there are other things that would kill him if he attempted to do them.

Then in that particular mill, if a fellow is sick, feels a touch of the grippe, or something of that sort, he goes down to the mill hospital, or to one of the stations scattered through the mill, and finds out what the matter is. If he has a temperature, he is told about it and is given some medicine, if necessary, or told to go home and stay there two or three days, or he is sent to his own doctor. They don't have a half-sick man at work.

The result is perfectly definite: The sickness absence has been reduced through the last few years; the company is getting more work from the employees; and the employee is getting more money from the company, and is getting better care. I will go so far as to say that that sort of thing should be required. I don't see any real reason why it isn't theoretically perfectly sound to require it. There is no real objection to it from any industrial or legal standpoint. They now require mills to have first-aid outfits; it is merely an extension of what the companies are doing themselves, or through their insurance companies, in the case of accidents. If it is not required, the more progressive mills will do it themselves. The smaller mills may group together and get a doctor who goes round from one mill to another. It is a new field for taking care of employed men and seeing that they are not getting into trouble. Information about industrial health hazards can come and is coming from federal and state boards. Our own is doing a good deal; Ohio is doing a great deal; the Federal Board of Health is doing a lot. That sort of thing can be taught to employers, and be reinforced by statute if necessary.

Now as to the cost of this industrial physician. It probably is not going to cost the manufacturer much more to do it than he would have to pay out in bookkeeping, under the health insurance proposal, in dollars and cents. The English investigation shows that to carry the record of the insured people requires one clerk to every 500 employees. Here it is a little more complicated than in England because it is based on a proportion of the wage instead of a flat rate. I took the matter up with a chief clerk, who would have to establish the system in a mill, and asked him what it would cost to do the work in that particular mill. At the end of two weeks he said he thought he could get it done for about $12,000 a year but he wasn't quite certain, and that it would delay considerably making up the payroll; he said if the payroll still had to be made up promptly as it is now, it would cost a good deal more than that. If it were run through the commonwealth, there would be a considerable sum of money which the employers would have to pay (something over a million dollars), merely for bookkeeping, and I would like to see that sum diverted to the more practical purpose of taking care of sickness in the mill. It would not cost much more.

Now, as to the question of insurance: It is almost impossible, in any way that I have heard of or can think of, to reach the unemployed man; to reach him and compel him; and it is almost impossible to reach and compel the seft-employed man. The reason the employer is brought in at all is because of the need of a tax-collector; he is the machinery for getting the premiums. There are other reasons but that is the chief of them.

So far as the unemployed man or self-employed man is concerned, sickness insurance must be left to education and the man's thrift and not be obtained by compulsion. The employed man can be compelled to insure if that is wise. It seems to me that if we can induce employers, by statute or otherwise, to look more closely after the illness of their employees and to eliminate harmful health conditions from store and factory; to compensate, as we already do, sickness arising out of the employment; and finally, through the diagnostic stations I have mentioned, to provide for earlier and better medical care and thus prevent or alleviate the illness loss for everybody, then with these things under way it might be practicable to consider sickness insurance, and the insurance in such circumstances should be managed and paid for by the employed themselves, with the State supervising and assuming the actuarial expense. That is the economical and self-respecting way for all concerned.

None of us like to be docketed and tagged and scrutinized; we prefer to handle our own business. So far as the American Federation of Labor has gone into this question, they are not yet in favor of it; I doubt if they will ever be in favor of it. I doubt if any of us would be in favor of saying we have got to have our pay envelope opened and so much taken out; that we have got to have some doctor whom we don't choose—or with very little choice about it—overhaul us, and we have got to be pretty well watched. I don't think it would work here. It does work in Germany. Nobody knows yet whether it works in England; it has been running there too short a time and we can't rely on the data. All our data come from Germany; we don't get a single thing from all the other countries: none from Norway, Russia, Servia. You cannot tell anything from the Austrian data; in using the German data, we must remember that they are based on the first thirteen weeks, which include accidents as well as sickness, to the cost of which employees contribute substantially.

Mr. Morss: Do you know whether in Switzerland the law has been passed or not?

Ans.: I don't at this moment. The data as to what laws have been passed and what became effective before the war, can be gotten from Mr. P. Tecumseh Sherman, a lawyer of New York City.

Mr. Morss: Referring to the Norton Co: As I understand their medical service, they offer free attendance to men going to the office. They encourage a man and almost force him to go if he is under the weather; and they really will treat him as long as he will go there; they will give him necessary medical advice. How much greater step would there be if they treated him at home, too?

Ans.: The difficulty is that you are then treading on the toes of, and making inroads on, other physicians, and that isn't quite fair. If, however, this station scheme were carried out, the man would be referred to the station in the district in which he lives, and it would be absolutely certain that he got care there.

Mr. Morss: Aside from the question of fairness to other physicians, otherwise, would it be a great step financially to take care of the men at home?

Ans.: It would cost considerably more.

Mr. Morss: Isn't it the point of view of the Norton Company that they are in this thing for their own benefit?

Ans.: It started in two ways: First the doctor took care of accidents; then the doctor who is in charge of that matter, who is an extremely able person, urged upon the officials that this matter of treating illness be undertaken. They finally did it purely as an experiment, and that experiment has paid. You can't say that they get their investment back more or less because you can't always tell, but you do find that there is less absence from the mill on account of illness; because of that, the employer benefits, and that is the argument that is used to sustain the health insurance proposal. That is perfectly sound, but there is no special harm in allowing the employer to benefit if the employee benefits, and he does because he is losing fewer sick days and the consequent loss of wages. If he can work 365 days, well and good; it certainly is to his advantage.

Mr. Morss: Isn't it a fact that philanthropy which doesn't pay gets down to straight charity? My point is that this is an experiment with the Norton Company but that they are getting out even.

Ans.: They must be getting out on it more than even, I should suppose.

Mr. Morss: Are the American Steel and Wire doing this?

Ans.: They can't yet see their way clear to take care of the illness. They do take care of accidents; they have a hospital and take care of the men until they get back to work. They have district nurses going to the homes. But as a definite scheme for watching illness, they have not undertaken it.

Mr. Morss: Do the medical fraternity in Worcester object to the Norton Company treating their men at the plant?

Ans.: I wouldn't say that they did, although I have heard that individual doctors objected.

Mr. Morss: The General Electric Co. doesn't treat their men for illness because they are afraid of interfering with the Lynn doctors.

Ans.: You get the same difficulty that you get in health insurance. I might like to have my own doctor take care of me. I don't know that I should like to have some mill doctor come to my house and run that little sickness of mine. I might prefer my own doctor.

Mr. Morss: You wouldn't object to the privilege of calling him?

Ans.: No, but you get to the point where the sick person's rights are imposed upon, and you do get to where it is unfair to the regular physicians. I should never advise going outside of the mills at the present state of affairs.

Mr. Morss: You have nearly covered the health insurance scheme; all that last year's law brought out, you have covered. You have arranged for a good deal of medical service by the state; you have offered mill dispensary service; and you have answered the point which I brought out concerning out-patient work. Then you propose that the employees shall insure themselves. I have had this worked out on a theory based on the idea that the state ought not to have anything to do with any insurance funds; that the state should be confined to furnishing definite medical service; that according to the German figures, it wouldn't be very far wrong to say that the medical attendance would be about 50 and the insurance would be about 50.

Ans.: It would not be very far wrong. . . . . .My suggestion that the state should have actuarial supervision is no different in theory than what they are now doing with life insurance or compensation. No insurance company can write a risk without having the insurance department of the state O. K. the rate. No health insurance association should write any risk without having that rate fixed by the state.

Mr. Morss: If you would get the employer and employee together and it should prove 50-50, the trouble would be malingering. I am very much impressed at the cheapness with which this is being handled by mutual benefit associations run by the employees, because they don't pay their detectives.

Ans.: Some mutual benefit societies are having trouble; I know of two, one in the West and one in Connecticut, which were very carefully framed. The Western one they thought would have to be given up because the expense was outrunning their estimate. The one in Connecticut is going to be rather sharply revised.

Mr. Morss: The one in the General Electric Co. is financially sound and shows what you can do if you run it properly.

You are beginning to run against the doctors. I have found that the doctors are about as conservative as any other sort of people, and the only way to run the doctors is to get some leaders to tell them where to get off. The only hope for working out medical attendance is to get the doctors to do it for you. Do you know any prominent doctors who are favorable to it and would take hold of it? How does *C*——think about it

Ans.: I have not talked with *C*—— but I have talked with *B*——, *W*——, *G*——, and *C*——, and with the head of a railroad medical system. If there is anything in it and if your committee has the least idea that such a thing would be possible now, the only way would be, to get the leaders in the state to say whether they think it can be worked out. Most of the doctors are pretty much opposed to it, as it stands.

Mr. Morss: You have encouraged me more than anyone else to favor the possibility of a scheme for health insurance. You have objected to the law as proposed, but I have never seen anybody in favor of the law as proposed.

Ans.: You have to start with perfectly well-known conditions and find out how far we can approximate relief. We may not be able to go the whole distance at once, but there is some way out that will work. There is no doubt about it. I don't say that anything I have suggested is a practicable suggestion, but it is along the lines of progress.

Mr. Morss: I want to see something done. In studying over the situation, I think the Norton Co. is putting it over me, and ten years from now I can't afford to be behind. It seems to be a question of mill administration. It makes no difference if they break even.

Ans.: It is perfectly possible today to lay down some principles of mill hygiene, just as principles of mill construction, and they are equally sound and equally profitable in product, and the manufacturer who follows those lines is going to get ahead, and the others fall behind, because you have to take in the human element of production more than ever.

Mr. Dresser: Of course I don't think that the manufacturer is to a very great degree responsible for illness, so that a plan such as you suggest of 50-50 charge between the workman and the employer isn't a fair adjustment of the cost in the community. The man who gets his income out of slum tenements, and who is in that business, is doing more to injure the health of that particular community, than any manufacturer.

Mr. Morss: Isn't it true, that no successful manufacturer puts his workmen in worse quarters, or as bad quarters, during the day as they are in at night?

Ans.: I think that is true. Tuberculosis comes from the slums, in the dark, dank tenements; pneumonia doesn't come in a mill; nor typhoid. If you speak of responsibility for disease, it seems to me the only fair thing is to try to find and reach the responsible party and, if there is to be a contribution among groups, take the responsible groups. Instead of making a division between the employer and employee, it would be more nearly fair to make it between the employer, the landlord, and the employee; or possibly between the employer, the landlord, and the backward community. Our towns and small cities don't spend much time or money on health matters.

Committee: Take your mill in Worcester: Those men are probably making on an average of $20 a week or more. If a man gets sick because of the place he lives in, or the way he lives, or the things he eats, I don't see how we can justify ourselves by compelling the employer (who may be getting about half a dollar a day profit out of the man) to pay fifty per cent. of the expense.

Ans.: I don't think we can. My whole proposition turns on "rendering unto Caesar the things that are Caesar's." I want the employer to pay for what he causes and that only. I entirely approve of the workmen's compensation for that reason.

Committee: Does it change the whole proposition if you open these dispensaries to the community? It would take care of those who are earning twenty dollars or less a week. There would be a certain portion of the community who ought to pay their doctor and wouldn't.

Ans.: Those people would be very shortly discovered. The station staffs would attend to them. The physician would lose less money than he does now.

Chairman: In the matter of the stations of which you speak: they would be established by the state and be under the supervision of the State Board of Health?

Ans.: Yes. I think we want to make certain there are these places, and with proper and reasonable regulations, and we want to interfere with the doctor's practice and fees among his people, and the patient's calling on the doctor that he chooses, as little as possible; and that, I think, can be worked out. Then you have got to rely for its highest success on the profession itself, and you can rely on that in *this* state. The standards of the profession are pretty high, and where you have got every man in it (the man who is a great surgeon in his community, or the one who is ambitious to make a name) going to these clinics: at Station A from 2 to 3 on Monday, or Station B from 3 to 4, you will get an influence through such association and ideals which will be very extraordinary, I think. I don't think this too wild a statement. I know what opportunities for such intercourse mean to young men in other professions.

Chairman: I have found a good many physicians who find fault with the establishment of dispensaries in our cities because it interferes with their practice to a certain extent.

Ans.: Physicians who are not on hospital staffs feel it, but with this scheme that would be changed. If a man is competent to practice, he will be on the staff; if he is not competent to practice, he won't practice at all.

Mr. Morss: Even assuming from your standpoint that we are going to have a health insurance along the general line indicated, would that in any way do away with the necessity of these stations which you suggest? Would the stations be the primary way of solving the medical problem anyway?

Ans.: I think it could be worked into the bill as it has been proposed, or could stand alone. In any event something of the sort is desirable for public and doctors alike.

Mr. Morss: If we are going to have health insurance, we would really need these stations? How is the most efficient way to work up this suggestion of yours? Whether we have insurance following it is a question. If we could get those stations established in the course of a year or two, it might be the first step to health insurance. Can't you outline a concrete way to get those stations?

Ans: It hinges on the medical service; your medical service is the very foundation stone. It could be worked out; any plan of insurance might be built up on it. It would be perfectly possible for an insured man by showing his card to get free medical attendance, etc., or pay him more and require him to buy it. A way to get at it I should think would be to get some of the 15 or 20 physicians who are interested in this matter and who are quite influential in their profession, and talk it over. They will see the troubles and the advantages that the layman cannot see. If they believe in it I think it will sound reasonable to the public.

Mr. Morss: Dr C——— started in, I judged, quite favorable to the whole idea of health insurance, and now he has thrown up his hands and says they ought not to touch the medical end at all, because it is impossible to touch it. He says: "If you are going to have health insurance, have the insurance and leave out the medical end." I think that is the last thing we want.

Ans.: You can't find that the doctors that are in favor of the Labor Association bill, go very far into the detail; they make very wild assumptions. Dr. L——— is a good man who has been interested in it, but it seems to me, as I read what he says, that he has to make a good many assumptions that the thing will work. It has not worked in Germany. They are always having strikes among the doctors; they can't work out a fair scheme of so much per visit or so much per head. It doesn't work in England. You have got to work out some plan that will keep alive the doctor's instinct to do his best work in his profession, that will preserve his ambition to make a name for himself in his profession and to get a fair return, and the German scheme and the English scheme don't accomplish that. I think this suggestion will come closer to it.

Mr. Greenwood: Don't you think this same amount of money spent in better wages and in education would make about as much progress as what we are trying to do along custodial lines?

Ans: More, I think. What has happened in the last few years is very extraordinary. I have been told that today the United States stands at the head of preventive medicine. I don't know whether that is so, but it is a very extraordinary thing that typhoid has been stamped out to such an extent. We have just as good record in Massachusetts as they have in Germany. We have our clean milk stations and are teaching the mothers in our cities how to take care of their children: clean milk is one thing which is reducing infant mortality. We are beginning to control many diseases.

MR. MCLAUGHLIN: Following out the lines you are suggesting, it seems to me that to be successful such a scheme would have to have the moral support of all the people. You speak of keeping records at public clinics: name, address, etc., and the nature of the disease. It has always been my experience that anybody who is sick doesn't want anybody else to know he is sick. No one has any use for a sick man. A degenerative disease a man is particularly secretive about; if you caught it in the early stages, you might be able to help him; but if he thought a public record were going to be made of it, he would delay going and you would have more disease.

Ans.: I did not mean that there should be any public records. Of course it is impossible that people should be required to have their history spread where the public would know about it; nobody would agree to that. Some method could be devised where such matters would be secret, and wouldn't be open to anybody whose business did not require him to see them. That would have to be very sharply guarded against, and I think it can be. That is one of the difficulties: we are dealing with a man's personal affairs; but I think it can be taken care of.

MR. MCLAUGHLIN: In talking with physicians, have you met many of them that claim that a great many of the physical troubles come from the teeth? (*Ans.*: Yes.) I am interested because I tried to have dental clinics established in Boston. It was opposed by the leading dentists and the leading institutions, who thought that it infringed upon their sacred grounds.

Ans.: Anything of that sort could be taken care of in the plan I suggest. The school physicians are doing good work in that line.

MR. MCLAUGHLIN: How would you take the initial step of organizing the physicians in the state,—the homeopaths, allopaths, etc., so that one set would work in conjunction with the other?

Ans.: In the first place, I would try to see whether the plan was a sound plan by consulting with persons who would be willing to look into it and work it out. If it is sound and can be supported by argument, then I say the physicians would have to submit to it. . . . I should make no distinction in the schools of medicine; get rid of quacks, of course, but I guess the different schools are working in closer harmony than used to be the case and I see no reason why they should not get on all right under this plan; they are essentially public servants, just as lawyers are, and what the state says, they have got to do.

MR. MORSS: You have worked it out in more detail the last few months?

Ans.: Yes, because I have heard more about it, but I have gone as far as I am competent to go. I talked it over with some of my doctor friends and found they did not think it a foolish suggestion. About the time it occurred to me the Massachusetts General Hospital established their clinic, a New York hospital established one, there was an editorial on the subject in a Cleveland or Cincinnati paper, and I ran across a man from Baltimore who said they were working on some such scheme, in connection with the milk stations. It is curious that it should have so shortly risen in various persons' minds; it makes me think there is something in it.

MR. COLLINS: Mr. Dresser is the first one who has seemed to be in sympathy with the fact that if the state has anything to do with the thing, the man who works for himself will not be helped.

Ans.: We get our minds so entangled with the employer that we forget that there are a number of people who are neither employers nor employees but who have to pay the bills.

COMMITTEE: It is a great problem to know who our employees are.

Ans.: He is an employee while he is in the mill. In the course of a year, a mill may have to hire 500 men to keep up a force of 100, because of constant changes among the workmen. Every single one of those men has got to be treated if he is there for two hours only, on exactly the same basis as if he had been there 20 years.

RECENT DEATHS.

FLOYD JOHN HODGE, M.D., of Florence, Mass., died on August 22, 1917, at Plainfield, Mass., where he had been endeavoring to recuperate from an illness suffered about a year ago. Dr. Hodge was born in Townsville, N. Y., and was graduated from Baltimore Medical College in 1908. He served for a year as interne in a hospital at Passaic, N. J., and then began practice in Florence. With the exception of a year spent in West Stockbridge, Dr. Hodge remained in practice in this town until obliged to give up his work because of ill health. He is survived by his widow, four children and his parents.

PHILIP W. T. MOXOM, M.D., of Brooklyn, N. Y., died by his own hand, in a period of mental illness, about the first of September. Dr. Moxom was born November 24, 1874, at Hickory Corners, Barry County, Mich., and was educated at Boston Latin School and Brown University. He received his medical degree at Harvard Medical School and began practice at Newton, Mass. He soon removed to Brooklyn, N. Y., and had been actively engaged there up to a short time ago. His health broke down from overwork during the poliomyelitis epidemic in that city during the summer of 1916 and he failed to recuperate. He left his practice to come to the home of his father in Springfield, Mass., early in the summer. In a period of depression he disappeared, and his body was found some days later in the woods near his house. He leaves a widow, his parents, two brothers and a sister.

DAVID MCINTYRE, M.D., 59, died at his home in Dorchester, September 2, 1917. He was born in Prince Edward Island, March 1, 1858, was educated at St. Dunstan's College and at New York University Medical School, where he took his M.D., in 1886. Moving to Boston in 1886, he opened an office in South Boston, practised there for some fourteen years and moved to Dorchester. He had been a Fellow of the Massachusetts Medical Society from the beginning of his practice. He leaves a widow, two sons and a daughter.

PRAMATH NATH ROY, M.D., died at his home in Charlestown, Sept 5, 1917, of heart disease. He was born in Bengal, India, in 1859, graduated from Glasgow University in 1885, married Caroline Forsyth Brown in Aberdeen in 1888, and settled in Charlestown. For some time he was surgeon to the Allan line of transatlantic steamers. He is survived by his widow.

The Boston Medical and Surgical Journal

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FOREIGN BODIES IN THE EYE.

By John F. Curran, M.D., Worcester, Mass.

In these days, when every physician is looking for something unusual in his favorite medical journal, one feels like making an apology for writing an article on the commonplace subject of foreign bodies in the eye. But, after treating several hundred cases in factory and private practice, I am convinced that my experience will be of assistance to brother practitioners who have comparatively few cases of this form of injury.

Since the establishment of factory hospitals it is the industrial surgeon who treats the majority of cases of this kind, and it is from his point of view that I present the subject.

At the Norton Company during the past year we treated 1300 cases of injury to the eye. Of these, 90% were directly attributable to foreign bodies. In fact, they constituted one-third of the entire number of cases treated at our hospital, and were second only, in frequency of occurrence, to lacerations of the upper extremities.

A foreign body in the eye probably causes more discomfort than all the other minor accidents combined, especially if it is situated beneath the upper eyelid, or embedded in the cornea.

A man with a foreign body in his eye will often neglect it until the pain causes him to suspend work. He then seeks aid from a fellow laborer, or perhaps from his family physician, who very often is not skilled in this particular branch of surgery. Under our present system, we have a minimum of lost time because the men are forbidden to treat each other's eyes, and because every man knows he is to report at the shop hospital for every accident, however trivial. No injured man is allowed to leave the factory without a permit from the hospital authorities.

DIAGNOSIS.

It is, of course, necessary first to determine the presence of a foreign body. The patient usually comes to us, saying that something entered his eye and is causing him pain. Very often no foreign body can be found because the increased flow of lachrymal fluid has carried it off, and the patient is in pain because of the injury to the sensitive nerve filaments in the conjunctiva. We are often misled by a patient saying, "It is under the upper lid." This is because the conjunctiva is most sensitive in that region. Sometimes for the same reason a patient will complain of this pain after the foreign body has been removed. Not infrequently, in spite of the patient's story, I have found the foreign body in the cornea and often on a level lower than the palpebral fissure.

In private practice I always ask the patient if an attempt has been made to remove the foreign body. Sometimes the particle has been removed by a fellow workman who has some skill in this practice. Many physicians remove the foreign body successfully, but, because of the abrasion of the corneal tissue and the injury to the sensitive anterior ciliary nerve filaments, the patient still suffers greatly, and he consults another doctor. If the pain is severe, an abraded cornea is the usual condition we find upon examining the eye.

Our method of examining the eye is this: First, we inspect the lower conjunctival sac. This can be done by simply pulling down the lower lid and telling the patient to look up, thus exposing the whole conjunctival surface. Then we take the upper lid. Here it is necessary to evert the lid in order to expose the whole conjunctival surface. The ease with which this can be done depends largely upon the experience and consequent dexterity of the surgeon. To do this easily, have the patient look down, grasp the lashes of the upper lid, place an applicator at the base of the tarsal cartilage and evert lid, thus exposing the entire fornix.

If no foreign body can be seen in either conjunctival sac, we then examine the cornea with the naked eye. If necessary, we use a watchmaker's glass, or if this is not successful, we illuminate the eye obliquely through a condensor. Large foreign bodies can almost always be seen with the naked eye, but small ones require a prolonged search with the glass and condensed light for aid.

If we anticipate difficulty in locating the foreign body, experience has taught us that we can make a quicker and more thorough examination by first putting the eye at rest by instilling two drops of a 4% solution of cocaine.

There are two conditions which may confuse us: first, pigment spots in the iris; and, second, pigment stains (improperly called "rust spots") on the cornea, where the foreign body has lodged.

Pigment spots on the iris can be differentiated from foreign bodies on the cornea by illuminating the cornea at different angles, thus showing the pigment spot to be at a different level than the corneal surface.

If the foreign body becomes imbedded on the cornea it always leaves a pigment stain or so-called "rust spot." It is often extremely difficult to distinguish between a foreign body on the cornea and a rust spot; even the specialist cannot always do so. The stain is usually a brownish-black in color and much denser at the periphery than in the center, where sometimes clear corneal tissue can be seen. The rust spot in these cases resembles a ring. My experience has taught me to leave the "rust spot" for the time being, having successfully removed the particle. In the course of forty-eight hours the spot in its entirety (it resembles a small scale) can be removed.

TREATMENT.

Here, and in industrial surgery in general, prophylaxis is of the utmost importance.

PROPHYLAXIS.

Many of the departments in our factory are dusty, although we strive for the best possible ventilation. In the presence of air currents foreign bodies enter the eye very frequently. Many of the men working on machines for shaping and truing grinding wheels suffer from this accident, in spite of the fact that they wear goggles especially devised to prevent it, and that the machines are equipped with suction devices.

In the Norton Grinding Company, where grinding machinery is made, this accident seems most frequent in the chipping and snagging departments. Here foreign bodies are apt to enter the eye with considerable force, and thus become imbedded. Since the cornea presents the largest undivided and exposed portion of the eye, most of the particles are found to lodge there. It is not unusual to find foreign bodies imbedded in the sclera of men working in these departments.

Our hospital records show that in 50% of the cases in which the foreign body is imbedded it is located on the cornea, in 5% on the sclera, and in the remaining 45% it is found loose in the conjunctival sac.

Fortunately we have never had a case in which the foreign body perforated the cornea or sclera. We have treated several such cases, however, coming from other factories which do not have a medical department.

CURATIVE TREATMENT.

Removal of foreign bodies lying loose in the conjunctival sac can usually be accomplished by means of a cotton wound applicator. Two drops of argyrol, 20%, are instilled and the patient discharged.

Imbedded foreign bodies, whether they are situated on the cornea or sclera, always necessitate the use of an anesthetic. It is our custom to use two drops of a 4% solution of cocaine in a boric acid solution.

Cocainae Hydrochloridi	xvi
Sol. Acidi Borici 2%	ʒiv

The foreign body then can be removed without much difficulty in the majority of cases, with a corneal spud. If a large foreign body is deeply imbedded it is best to use a spear-headed spud.

Technic for removal of large foreign body imbedded in cornea: Eye cocained, lids held apart; foreign body located with aid of glass if necessary. Point of cornea spud introduced as nearly as possible between the foreign body and the corneal tissue. The foreign body is then elevated and removed with a swab, in case it slips from tip of spud, as it does very frequently.

If a small foreign body is deeply imbedded it is best to use a Graeffe cataract knife. We feel in these cases that the cornea will be more or less injured, but that a small laceration is to be preferred to a large abrasion (which would result from the use of a spud).

After the removal of a foreign body is accomplished routinely, we instill two drops of a 20% solution of argyrol because of its antiseptic and astringent properties.

If there is much conjunctivitis present and the man is suffering considerable pain, the following is frequently used:

Cocainae Hydrochloridi	gr. i
Glyceriti Borici	ʒi
Aquae Camphorae	℥ *ad* ℥i

Sig. One or two drops every hour or two.

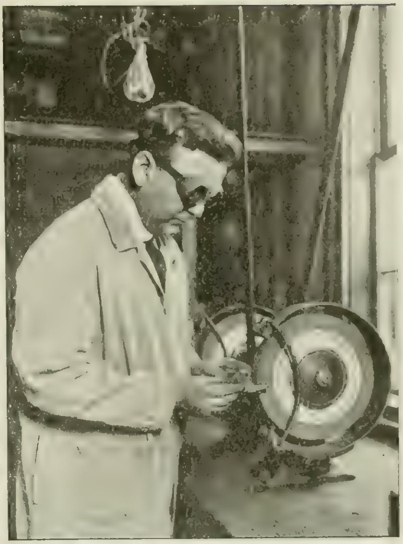
The patient is advised to use hot compresses at home.

When a foreign body which was imbedded is removed, we always instill two drops of a 1% solution of atropine to put the eye at rest. When the eye is relaxed the corneal wound heals more rapidly and the patient is far more comfortable. We supply the injured men with colored goggles in these cases, and they are instructed to apply hot compresses at home. Seeing our cases promptly, as we do in nearly every instance, we seldom have men lose time, even when the injury is extensive.

GOGGLES.

Through the coöperation of our Safety Engineering Department, we feel that the number of these accidents has been reduced to a minimum. Our success in this respect we attribute largely to the goggles we are now using throughout the factory.

Probably the most successful means of eye protection in industry is goggles. These should always be worn in work involving grinding and chipping, and where sparks or dust result from the operation. Of course a different type of goggles is needed in grinding and chipping from that needed where a fine dust is involved because of the difference in the flying particles.

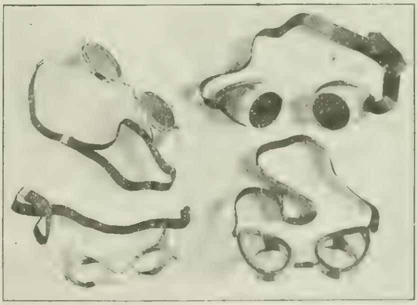


Grinding Wheel Stand, Bench Type.

Properly equipped with protection hoods. Note goggles on operator.

GRINDING GOGGLES.

They have these advantages: an adjustable elastic head band, light weight nickel-plated frame, solidly constructed lens frames with a ridge inside the glass to prevent its caving in, and a reinforced bridge. They come in six assorted sizes. They may be had with green lenses of various shades, and thus do away with the injurious integral red and ultra-violet rays common in steel works and around blast furnaces, where there is danger of hot metal spattering.



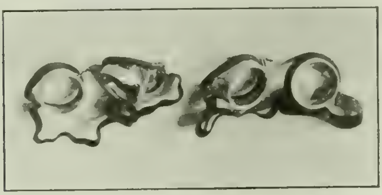
DUST PROOF GOGGLES.

They were specially designed for us. They have an elastic head band, frames of aluminum, and rubber padding around the lens frames.

The two lens frames are connected by a piece of chain about an inch long, and allow of adjustment by merely turning the optical center. The glasses are the same as in the grinding goggles. The rubber padding (which lessens the effect of a blow on the goggles) may be replaced by leather if the goggles are to be worn where acid fumes would affect rubber.

The following incident is an example of the effectiveness of these goggles.

> A man was working in the truing room, siding a ten-inch wheel. He evidently did not have the wheel in the machine tight enough, for it flew out, and would have struck the operator squarely in the eye had he not been wearing goggles. The force of the blow may be judged from the accompanying photograph. The glass was broken and one lens frame badly bent, yet the man received nothing but a bruise, due to the blow being transmitted through the frame to his cheek. The effects of the blow would have been more severe had it not been for the rubber padding. It was not necessary for this man even to report to the hospital.



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THE CHINESE BARBER AND HIS USE OF AURAL INSTRUMENTS.*

BY A. M. DUNLAP, M.D., SHANGHAI, CHINA.

I HAVE been asked by your secretary to tell you something about the common practice of treating ears among the old-style Chinese barbers. I say "old-style," as the Revolution of 1911, with the nation-wide cutting off of that Manchu invention—the queue—has created a new class of modern barbers. These men are so engaged with the ordinary undertakings which belong to the barber-shop, as you and I know it, that either they are unable or have not the desire to carry on the practices of the old-time barber.

I do not mean to say that the barber of old China has passed, with his practices, which remind us of those of Occidental barbers in ancient times. Even in as enlightened a city as Shanghai, they are constantly to be seen on the street corners.

There are still many in China who, if they do not actually wear a queue, have the hair bobbed long and the forehead shaved high. These doubting souls are prepared, while adhering to the new order of things, to revert to the old, in the event of a political change, by bringing from its hiding-place the once-admired queue, and fixing it in its former position. As the present government increases in power, the hiding-places will be forgotten and the old barber will either find himself cast aside, or be compelled to take up the newer methods.

Today, these old men can be seen with their wash-stands, basins, and a single towel, which does for everybody, on the shady side of the street in summer and on the sunny side in winter. The customer seats himself on a hard stool and the barber proceeds to lather the front part of his scalp, and to shave it, down to the ears. It is unfortunate that this style of wearing the hair cannot be introduced into Western countries, thus making high foreheads the rule. The scalp finished, the face is shaved, or rather passed over with the razor, as the growth on the average Chinese face is exceedingly scanty. I have sometimes thought that the queue may have had something to do with this sparsity of growth, as the Japanese, of a kindred race, are able to grow fair moustaches and beards. It will be interesting to see what several queueless generations will do to increase this facial growth.

But to return to the barber—his shaving is rarely completed without passing the razor over the entire cheek and nose. Occasionally he may shave as near the inner canthus of each eye as he thinks he may safely go. In watching them, it has seemed to me that this last act was more for the pleasurable sensation it gave the customer, than for the removal of hair. It is just possible, too, that the barber feels he has not earned his fee of a few coppers, unless he does his part to make it "a man's job."

Just as our barbers ask if we will have a shampoo, the Chinese wishes to know if his customer will have his ears shaved. I have been unable to find out how and why this practice started, but apparently it is very old, since it is followed by practically all the Oriental races. It is likely that, many years ago, the barber became the logical man to remove wax and detritus of all sorts from the ears, and as he became more adept at it, he added the preventive measure, as he considered it,—the shaving and cleaning of the ears of his customers. This practice could not have survived, however, had it been at all disagreeable. I have questioned many Chinese as to why they have it done, and invariably they give the reason that they like the sensation.

The barber understands how to pull the ear upward and backward in order to straighten the canal. He uses, of course, no head mirror, but if he is in a room, he will stand so that the light from the window passes over his shoulder. His first manipulation consists in shaving all the hairs he can see, in the external canal, by using a long, narrow knife. Then, by means of long forceps, and curved needles, he picks away the particles of hair and epidermis which do not come with the knife. A feather ball at the end of a slender piece of bamboo is then twirled in the ear, to remove the finer particles.

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* Read before the New England Otological and Laryngological Society, January 23, 1917.

I have taken occasion to examine the ear of a man immediately after his ear had been shaved. All the hairs and the superficial layers of epidermis had been removed, and while there was no blood to be seen on the outside of the ear, there were many minute hemorrhages, where the knife had gone too deep. The epidermis, deep in the canal where the razor had stopped, was rough and ragged.

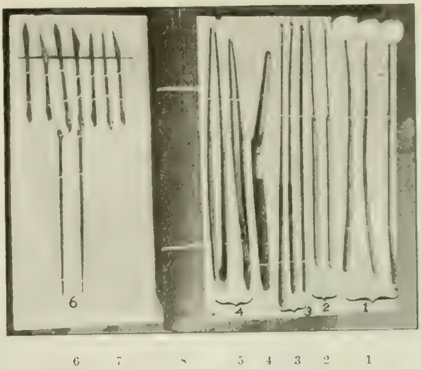
Aside from the accident of cutting away too much, the ear drum may be punctured with the long needle. Many a patient in the clinic has volunteered the information that the barber gave him pain at his last visit, since which time he had had a running ear. It is conceivable that a needle, which is never sterilized, might cause an infection if thrust through the ear drum. Examination of such cases may show an irregular perforation, which might come from pulling the point of the needle sidewise; or a pin-point perforation, resulting from a direct thrust.

Perhaps the most common sequel of this pernicious practice is the growth in the external canal of soft granulations, which later become quite firm. These condylomata come, undoubtedly, as a result of the repeated irritation with the knife, and the accompanying infection. A daily clinic of fifty will usually produce four or five patients with their external auditory canals either partly or totally blocked with these masses. Many such patients have absolutely no middle ear complications.

Furunculosis and diffused inflammation of the external meatus are extremely common, as a direct result of the ministrations of the Chinese barber, particularly among children and young adults.

Muscular treatment forms another important function of the barber. As I have watched them. I have thought this might well have been the origin of osteopathy. With the barber's foot raised to the stool beside the customer, first one arm and then the other is laid over his knee, pulled, rolled, flexed, and massaged. This done, the forehead may be attacked, and the skin stretched and pulled. The skill of the barber is evident finally, in his ability to massage the spinal column, giving to his thumps a rhythm similar to that of clod-hopping. As the clod-hopper gets his effects by dropping his feet in different positions, so the barber gets his, by working with the fist closed, partly open, or with the full-spread palm.

The barber is not to be blamed for all the injuries to the ear which result from manipulations. The duck-down ear-dusters, before mentioned, are sold broadcast by street hawkers for use "in the home." The ear-spoon forms a part of every Chinese married woman's head-dress. It is made of jade, ivory, gold, silver, or brass, according to her station in life, and used for every purpose, from ear-cleaning to the picking of the teeth.



(1) Duck-down ear twirlers, (2) bamboo scoops, (3) bamboo scoops (fancy kind), (4) razor, (5) forceps, (6) ear cleaners (also used as hair-pins), (7) sharp pointed blades for use in acupuncture, (8) bamboo tube, in which all instruments are kept.

At odd moments the barber is a doctor for persons having fever, which, in the minds of the less enlightened, means the presence of an evil spirit in the body. For the purpose of "letting out" fevers the barber uses a sharp needle, or a knife-needle, with which he punctures the forearm or front of the chest in numerous places. A fair amount of blood is drawn in this way. The leech is also used for the same purpose.

No one can live in China long, without seeing individuals here and there with a curious marking on the throat. The same effect could be obtained if one were to paint parallel dark-red lines, a half-inch wide, up and down the front part of the neck. The barber has produced this condition as still another treatment for fever. It is really internal bleeding into the subcutaneous tissues, caused by picking up the skin between the first and second fingers, pinching and stretching it, and allowing it to snap back into place. The same result may be obtained by using an old copper cash piece and passing it rapidly over the skin until the above effect is produced. There is no external bleeding by this method. Another favorite place for this treatment is the back. Contrary to popular opinion, the Chinese have as much pain during these operations as any of us would have. They bear it because they have a stoic faith that it will rid them of their trouble.

Incidentally, I might say that the rule of every Chinese medicine-man or barber-doctor is "pay as you enter." Treatment is given much more carefully, perhaps, if the fee is on the table before it starts. Should a patient leave without depositing his fee, he probably would forget to pay ever afterward. This custom of paying at the time of treatment is really preferred by the Chinese and would not be a bad one to adopt in the West.

For all his misguided attempts, or his contributions to the common welfare, the barber is classed among the lowest, if not the lowest, in the social scale of the Chinese people.

RESULTS OF FURTHER STUDY IN LEG ROTATION.

By C. L. Lowman, M.D., Los Angeles.

In continuing the work and observations on faulty weight-bearing in reference to the overstretching and weakening of the external rotators of the thigh, I wish to refer you to the previous articles. The effects on the feet from weight-bearing in inward rotation is considered in the first paper published in the Boston Medical and Surgical Journal, January 18, 1912. Faulty relations in skeletal alignment between the leg and body, produced by relaxation of certain groups of leg and foot structures, are taken up in the second paper, entitled "Relation of Foot and Leg Muscles to the Statics of the Body," published in the Boston Medical and Surgical Journal, February 5, 1914.

For the past five or six years, particularly, I have been intensely interested in the study of posture in children, in an effort to correct relaxed weak feet which had dropped into valgus, or to raise those that from babyhood had never been anywhere else. I very soon attempted to get away from the use of metal on children in the treatment of these conditions. It is a physiological law that muscles grow strong by being used. When splints prevent their working, as arch supports do, in foot conditions, then weakness is apt to follow unless carefully prescribed gymnastics are carried out to offset this vicious effect.

A very high percentage of the posturally relaxed children have faulty foot positions, either congenital or acquired, but usually the latter. They also usually have one or more groups of weakened or overstretched ligaments or muscles, caused by a too rapid growth or increase in body weight, plus a faulty gravity line of the leg, or due to weakness more pathological, as in malnutrition.

The treatment of the condition must not be confined to the feet; they are only the foundation. To expect the weakened muscles to hold the foot, even assisted by shoes or arch supports, and thereby control faults in the upper leg and body, is asking a great deal. The force necessary to control a long lever with a short one is so great that we should not consider the foot end of the problem alone. When the thigh droops into inward rotation, from whatever the cause, primarily or secondarily, the weight falls through wrong lines onto the lower leg and foot structures. The control or prevention of this faulty thrust, which increases in direct relation to the degree of deviation, should be the aim in any line of treatment. Torsion deformities in the leg bones and mal-alignment of the joints are induced when this faulty thrust is allowed to go uncontrolled.

To be permanently effective and of positive and constructive value in the physical life of the child, the treatment should be broad and comprehensive. Consequently, the body balance and a consideration of its relation to foot and leg postures is necessary. All children should be stripped for examination, although they have been referred only for weak ankles, flat-feet, knock-knees, or bow legs. Then the points of mal-alignment in the back, pelvis and thighs will stand out and the parents can be shown their effect on the lower segment.

Since the body weight falls onto the legs through the pelvis, and the thigh movements are controlled almost wholly by muscles fastened to and near it, in order to control the thighs we must control the pelvis and back. My first experiment in controlling thigh rotation was in a girl of ten with very relaxed, flat feet, for which she had been treated by others for two years. She showed marked pronation with prominence of the inner femoral condyles; inward rotation of the thighs; hollow back, and prominent abdomen. She was made to stand on the outer borders of her feet and a three-inch strip of adhesive was passed over her sacrum and buttocks down across the thighs spirally to the inner condyles. She was then told to let her feet down and found that she could not, but was held in varus and her lumbar curve was flattened. She was allowed to wear this without other support for the feet for a week. She then reported that it had held her about three days before slipping.

Appreciating the fact that the soft, sensitive skin over the inner aspect of the thigh could not stand this pull very long, I thought of connecting this control to the upper end of the regular spiral foot strapping ordinarily used for pronation. Thus the thrust or force of the body weight falling on the sling passing under the relaxing arch, reverted back into the pelvis, is used to control the pelvic position.

Not being able to keep a patient strapped with adhesive I had an ordinary pelvic girdle made, snugly fitted above the crest and sacrum. Two straps, one and a half inches wide, of folded coutille or strong muslin, were sewed to this girdle. These passed from the midline posteriorly downward, outward, and forward, crossing the thigh anteriorly to the inside of the knee, over the inner condyle, behind the bend of the knee, and outward over the outer aspect of the calf, ending in a buckle at about the junction of the middle and lower thirds of the leg. Smaller straps of the same material, broader at their distal extremity and tapered at the top, according to the width of the buckle, are tacked in the shoes just back of the base of the fifth metatarsal. These pass inward under the front of the os calcis and scaphoid, through a slot in the

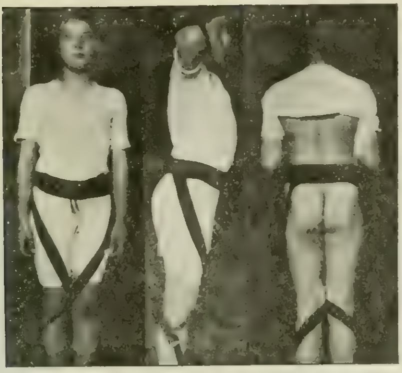


Fig. 1. Fig. 2. Fig. 3.

stocking, upward and outward to the buckle on the leg strap. The patient stands on the outer border of the feet while these straps are buckled. The weight borne on this sling pulls the leg straps taut, makes outward pressure at the knee, and pulls down the girdle. See Figures Nos. 1, 2 and 3.

This first child wore the apparatus for ten months until it was outgrown. Returning six or eight months later she was found to have excellent posture throughout and straight foot position. The child's mother, who made the outfit, informed me that she made one also for herself and since wearing it the pain had stopped in her bunions, showing that even in the adult the weight could be shifted to the outer border of the foot by this means. Since this time I have used this method on thirty or forty cases and demonstrated its usefulness, at least to my own satisfaction, but feel it might be modified or improved to advantage. On patients who are wearing a spine brace these straps may be fastened to the brace instead of to the girdle. See Figures Nos. 4, 5 and 6.

In cases of flat back the straps can be fastened to the girdle higher up and pass across the crest far enough forward to increase the pelvic tilt and correct the flattening. In older children, girls especially, with relaxed backs and round shoulders, a proper corset or corset waist with shoulder straps can also be used in conjunction with the pelvic attachment. Care should be taken, however, that the girdle does not slip down so that any pull is transmitted to the shoulder girdle. This girdle is lightly boned behind; wide enough to be comfortable and to give good abdominal support. It may be high enough in the extremely lordotic type, to bridge over the lumbar area to the lower dorsal and carry stiffer steels instead of bones.

In spiral cases with genu recurvatum or in cases that toe out more, to slacken to the pull on the straps, the leg straps should be brought down behind the thigh, passing back of the knee to the buckle on the inner aspect of the leg.

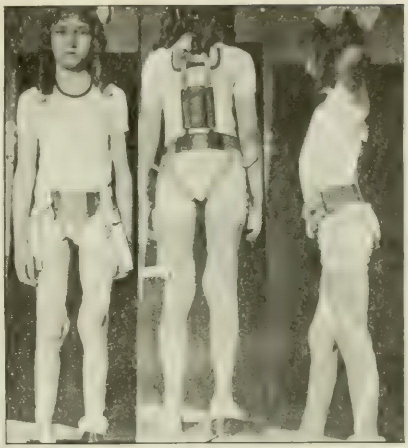


Fig. 4. Fig. 5. Fig. 6.

The shoe is usually corrected by having one-eighth inch raise on the inner border of the heel and one-eighth inch raise on the outer border of the sole under the heads of the fourth and fifth metatarsals, but not extending to the toe.

The children are then given local and general corrective gymnastics, games being used for the smaller ones. Especial attention is given to the external rotators by using the foot fixation board, as described in the first paper. When a stronger effect is desired, or when from any cause it is best not to have the patient exercise in the standing position, the following exercise may be substituted: Patient lying prone on table with feet projecting beyond; thighs relaxed and rotated inward. Assistant grasps heels, resisting, while the patient strongly rotates the thighs outward until the heels touch. Patients are not allowed to roller skate or to walk in their bare feet unless they walk on the outer border.

All exercises for the postural conditions should be given as much as possible in the corrected or overcorrected position, in order that the shortened groups may be stretched, and weakened groups shortened and brought back into balance.

Both for use at the gymnasium and at home balance board exercises on a special board are given (see Figure No. 7). To make this apparatus, have two boards, one inch thick, two and a half to four inches wide, and ten to sixteen feet long, according to the yard or house room, covered with rubber matting. These are supported or nailed to three or four triangular blocks at whatever angle is desired. (I usually have them tell the carpenter to make it one-quarter pitch like the ridgepole of a house.) A

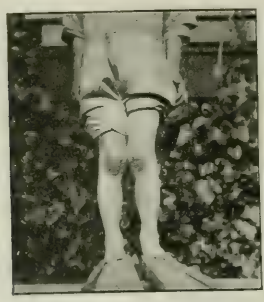


FIG. 7.

crack one inch wide is left between the boards. When the child has learned to walk this board in good form and with correct body poise, a sand bag is placed on the head; he then has to look farther ahead and the wide crack is an advantage for orientation. If desired, weights in one or both hands can be added and nearly all the other balance-board exercises can be given. Tennis shoes may be worn, but only while doing this exercise or wearing the leg harness.

After they have mastered various exercises with the board on the ground, the apparatus is raised from six to twelve inches. Every two to four weeks an additional six-inch raise is made until the board is two feet or so from the ground. This greatly increases the difficulty and necessitates greater skill and form, increases the interest, and makes greater demand on the guy wire muscles of the legs.

On this apparatus the body weight stretches the peronei, and the relaxed thigh rotators above and the tibials below must take up the slack to maintain the balance. I insist that the parents do not let the child play on this apparatus but use it definitely and deliberately at a regular time every day; and use it as a game or a reward of merit.

The photographs show both the leg harness and the apparatus.

CARCINOMA OF THE UMBILICUS.

BY M. G. WOHL, M.D., OMAHA.

[From Pathological Department, Nicholas Senn Hospital, Omaha, Nebraska.]

A REVIEW of the literature of tumors of the umbilicus convinces one as to the infrequency of their occurrence. Malignant tumors are exceptionally rare. Cullen (The Umbilicus and Its Diseases, Saunders Co., 1916) has been able to collect from the literature only twenty-two authentic cases of primary carcinoma, both of the glandular type, originating from remnants of the omphalomesenteric duct, and of the squamous character, starting in the skin over the umbilical scar.

Of the secondary carcinoma, there are only fifty published cases, and out of these only five cases were secondary to carcinoma of the intestines. (Of the remaining cases, twenty-seven were secondary to carcinoma of the stomach, five to carcinoma of the gall-bladder, nine to carcinoma of the ovary, and four to carcinoma of the uterus.)

The following case of carcinoma of the umbilicus, secondary to the intestines, came under my study at the Nicholas Senn Hospital, and because of its rarity, I believe its publication is warranted.

Mrs. C., aged 62. Nothing in her family history that has any bearing upon her present condition.

Past History. Never sick so as to be confined to bed.

Present Illness. Last summer she noticed a small, hard mass to the right of the umbilicus. No pain nor tenderness. The mass gradually increased in size until it reached the present size of an adult's fist. As far as she remembers, she has never had any injury to the umbilicus. For several years she has been constipated. She complains of a good deal of belching; never vomited. Appetite good, but she lost twenty pounds in weight last winter. Upon examination, there was an elevation, irregularly round and nodular, about four inches in diameter, with unbroken skin, and the umbilicus in its center. It was hard to the feel. Patient was admitted to the Nicholas Senn Hospital, March 25, 1916. Operated upon by Dr. A. P. Condon. A lipectomy incision was made surrounding the umbilical mass. Mass found to be the size of two fists. It had pushed parietal peritoneum towards abdomen and had entirely displaced the recti muscles in the region of the tumor. It was firmly adherent to the transverse colon, so that about eight inches of transverse colon were removed with mass and ileocolostomy done. A mass the size of a duck's egg was implanted upon the sigmoid and had the appearance of cauliflower growth. It was easily removed and did not invade the walls. Patient died of peritonitis.

Pathological Report. The tumor mass measured 15 centimeters by 10 centimeters by 6 centimeters. It was covered with skin. The umbilicus was retracted. Upon section the tumor presented the appearance of a cyst, the apparent walls of which were beset with solid masses of tumor tissue. Besides the tumor nodules there was clotted blood. The cyst-like appearance of the new growth was probably due to the breaking down of tissue, since no true cystic walls could be made out. Coils of large intestine were attached to the tumor. (Figs. 1, 2.)

Microscopic examination of the sections taken from different parts of the tumor revealed the typical picture of glandular carcinoma. In places the carcinomatous tissue was arranged in solid cords. The cells lining the glandular and solid structures were of the cylindrical type, with deep-staining nuclei. The stroma of the tumor consisted of connective tissue which was well vascularized. The connective tissue stroma just beneath the squamous epithelium of skin contained melanotic pigment. However, the skin was intact. (Figs. 3, 4.)

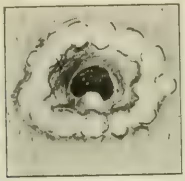


Fig. 1. External appearance of carcinomatous umbilicus.

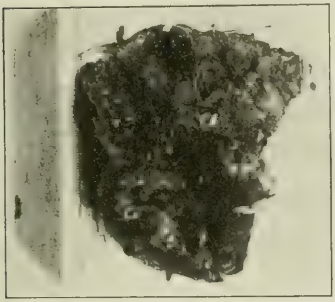


Fig. 2. Appearance of inner surface of carcinomatous umbilicus after removal.

Diagnosis. Adeno-carcinoma.

We agree with Dr. Cullen (to whom we wish to express our thanks for the examination of slides of this case) that the tumor is secondary to carcinoma of the intestines. This view is supported by the fact that the histologic structure of the tumor had all the earmarks of adenocarcinoma of the intestines. Also, as we stated above, it was attached to the transverse colon, and a nodule the size of a duck's egg was on the sigmoid. The histologic picture of this tumor tissue was identical with that of the umbilical tumor, excepting its more cystic nature (Fig. 5).

Symptoms and Diagnosis. From the few cases reported in the literature it would be impossible to build up a clinical picture from which a diagnosis could be made. A point of considerable practical importance that is well brought out in our case, is the fact that an umbilical tumor developed long before the primary intestinal carcinoma gave any signs indicating its presence. This seems to be the rule in carcinoma of the umbilicus. Therefore, any lump that develops at the umbilicus should be seriously considered, and the probability of its being secondary to an abdominal tumor borne in mind.

I wish to acknowledge my indebtedness to Dr. F. Kuegle for his aid in the preparation of the illustrations.

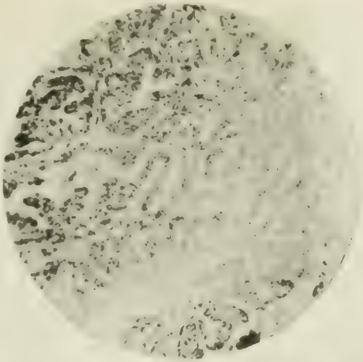


Fig. 3. Photomicrograph (low power) showing the glandular character of the tumor. Lower field shows nests of cancer cells.

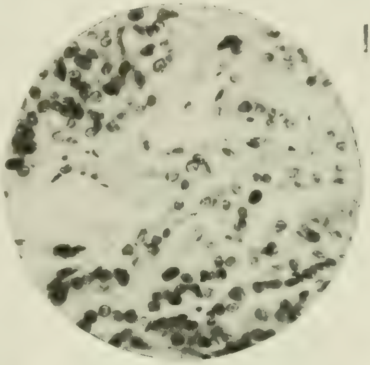


Fig. 4. Photomicrograph (high power) of adeno-carcinoma of umbilicus.

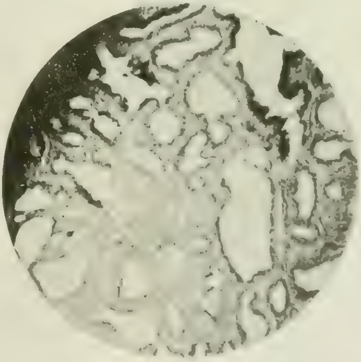


Fig. 5. Photomicrograph (low power) of section from nodule on sigmoid. Note the glandular nature of tissue.

TABLE INDICATING THE CASES OF CARCINOMA OF THE UMBILICUS SECONDARY TO THE INTESTINES.*

	Reported by	Sex	Age	Location of Primary Tumor	Condition of Umbilical Region	Remarks
1.	Lage: Schmidt's Jahrbuch, 1847, lv, 295	———	—	Large bowel	Umbilicus felt hard. Brownish red growth.	Patient died of carcinoma of the large bowel.
2.	Lebert: Bull. Soc. Anat. de Paris (Reported by Chuquet), Du Carcinome generalisé de peritoine. Paris, 1879, No. 548	Female	54	Rectum	Hard tumor at umbilicus	Patient complained of pain and colic at umbilicus with digestive disturbances. Autopsy revealed carcinoma of rectum.
3.	Villar: Tumeurs de l'ombilic. Thèse de Paris, 1886	———	53	Transverse colon	Reddish nodular tumor, slightly movable and ulcerated	Tumor of umbilicus developed during course of clinically diagnosed carcinoma of transverse colon. Autopsy proved similarity of umbilical and primary growth.
4.	Barker: Lancet, London, July 19, 1913	Male	37	Transverse colon	Discharging sinus. Induration extending for several inches in left rectus muscle.	Occasional pain at umbilicus for several months. Swelling at umbilicus which was opened and it healed, then it burst and kept on discharging.
5.	Pernice: Die Nabel Geschwulste, Halle, 1892	Female	52	Large intestine	Nodules in region of umbilicus	Burning pain, worse on pressure. Abdomen distended with fluid. Exploratory operation revealed general carcinomatosis.
6.	Wohl: Present issue	Female	60	Large bowel	Protruding immovable mass at umbilicus	A lump in the umbilical region developed for last 6 months. No pain. Patient died of peritonitis.

* Most of the data for this table was taken from the admirable work of Cullen, "The Umbilicus and Its Diseases," Saunders Co., 1916.

Clinical Department.

RADIUM TREATMENT OF BLADDER AND PROSTATIC CARCINOMA.*

By B. S. Barringer, M.D., New York City.

[From the Memorial Hospital]

This report is based upon twenty-five cases of carcinoma of the bladder and thirty cases of carcinoma of the prostate treated by radium since October, 1915.

BLADDER CARCINOMA.

In making a diagnosis of carcinoma of the bladder in these cases more stress has been placed upon the clinical findings than upon the microscopic examination. Such clinical findings making for malignancy are, in order of their importance:

1. Induration revealed by touch (rectal or vaginal) or by cystoscopy. When a tumor feels hard, one is much more certain of one's findings than when one sees (or thinks one sees), by means of the cystoscope, an induration of the base of the tumor. In the latter case the personal equation enters much more than in the former.

2. Slough. Only malignant tumors slough. Such slough appears as grayish or whitish areas in the tumor mass. Here again one may err, and I have often been surprised how one's idea of a bladder tumor changes with subsequent cystoscopies. In difficult cases a number of cystoscopies may be necessary accurately to determine both the extent and the appearance of the tumor.

3. Reaction to fulguration. Keyes and Geraghty have called attention to this feature. Benign tumors are quickly burned off by fulguration. Malignant tumors react stubbornly or not at all.

4. Age. The older the patient the more likelihood of carcinoma.

5. Multiplicity and size of tumor. So-called benign papillomata are more apt to be multiple than carcinomata. The size of tumor rather speaks for difficulties in its removal than for malignancy.

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* Read before the New England Branch of the American Urological Association, Boston, March 13, 1917.

The microscopical examination in twelve of the twenty-five cases has shown carcinoma. According to the microscopical examination, these twelve are classified either as papillary or as diffuse carcinoma.

APPLICATION OF RADIUM IN BLADDER CARCINOMA.

The technic of the application of the radium is: two capsules of screened radium (0.6 mm. of silver and 1.5 mm. of rubber) from 50 to 100 mc. are placed in the bladder through the sheath of the cystoscope and allowed to remain there 6 to 8 hours. As 90% of bladder tumors are on the bladder base, the radium so inserted is in close contact with the tumor. If the carcinoma is on the vault or lateral walls, the patient lies on his abdomen or on one or the other side. After the treatment the radium is removed *per urethra* by a linen thread attached to the capsules.

The initial pain experienced is only that of the cystoscopy. The after-burn varies from none at all to more or less severe pain, beginning a few days after treatment and lasting from one day to several weeks.

In extensive carcinoma involving the bladder sphincter, irradiation may very much increase both the pain and the urinary frequency. It is to be used in these cases with caution.

EFFECT OF RADIUM ON BLADDER TUMORS.

In a large majority of the cases in which I have applied radium to bladder tumors, the hematuria has stopped two or three days after the irradiation. There is a suggestion in this that the primary effect of the radium is upon the blood vessels. If this is so it would in a measure explain why papillomata of the bladder, rich in blood vessels, react somewhat more slowly to radium than true carcinomata, which have poor and imperfectly developed blood vessels.

In some cases the rapidity of the action of radium is astonishing. Case 1 was irradiated January 19, and on February 4 (sixteen days later) cystoscopy showed that an extensive carcinoma had entirely disappeared.

Radium burns of normal portions of the bladder have occurred only in those cases in which the carcinoma was around the bladder neck, and in which the radium was pulled into the urethra and kept there for a long time. I have had two such cases; the burns last a long time, and cause considerable irritation. Division of the radium dose into two or more tubes, using somewhat smaller quantities, change in the position of the patient during application, and a fairly long interval between irradiations—six weeks or more—ought to prevent such burns.

SUMMARY OF CASES.

Two of the 25 cases of carcinoma of the bladder treated would have been considered good operative risks; the other 23 cases, because of the extent of the tumors, were all impossible operative risks. In 4 of the 25 cases (3 confirmed microscopically as carcinoma) radium has locally removed the growth. One of these has been cystoscopically cured for 10½ months, one for 5 months, and one recently. One has what is probably a slight local recurrence, although pathological examination of a piece removed does not confirm this view. These four cases are of sufficient interest to report in some detail.

CASE 1. C. A. G., aged 69. Signs of malignancy: large tumor, vaginal induration not determined; sloughy in part. Microscopical diagnosis of carcinoma; fulgurated twice, and no headway.

History. Chief complaint, urinary frequency for the past year,—night 3 to 4 times, day every 3 to 4 hours, and pain following urination. She had been passing bloody urine for the past four months. A number of months before I saw her she was cystoscoped, and a diagnosis made of inoperable carcinoma. Cystoscopy showed large red carcinoma with necrotic patches on left side of her bladder, obscuring her left ureteral orifice. Tumor was probably as large as a fifty-cent piece. Specimen removed showed (Dr. Ewing): "The section is of a small mass of tumor tissue 2 mm. in diameter. It shows the structure of a small alveolar carcinoma, much inflamed, with dilated blood vessels. The cells are clear, irregular in size, with large hyperchromatic nuclei, and arranged in small groups. The stroma is scanty."

January 19, 1916, 100 mc. of screened radium in her bladder for eight hours.

February 4, she reported that she had some frequency and severe bladder pain for two days; then everything normal. Cystoscopy (with Drs. Keyes and Jeck) showed that the tumor had gone; the area was covered with normal mucous membrane, and the ureter visible.

December 19 she had a stellate, white scar over place occupied by tumor. No tumor visible. Reduplication of ureter.

CASE 2. C. T., aged 59. Signs of malignancy: tumor as large as a ten-cent piece; no induration; ulcerated tumor. Microscopical diagnosis of carcinoma; fulgurated four times in six months and recurred.

History. Eight months before seen had occasional attacks of painless hematuria. He was cystoscoped, and a papilloma near the left ureter was seen. This was burned with high frequency four times in about six months, but had always recurred. Dr. Keyes saw it in January, 1916, when it was an ulcerated area with carcinomatous-looking lumps. A piece removed showed diffuse carcinoma (Dr. Ewing).

"The section is from a mass of tumor tissue 5 mm. in diameter. It presents a small alveolar and diffuse carcinomatous structure. The cells are extremely atypical, and some are of very large size, with very hyperchromatic nuclei. The outer portions are hydropic, the central areas show fibrosis, and here the tumor cells run in narrow rows or small groups."

February 11, 1916, 214 mc. of screened radium for seven hours.

May 2, cystoscopy showed normal mucous membrane over the space occupied by the carcinoma. He had had 7 or 8 erections since treatment, while he had been practically impotent for 10 years before.

July, he had gained 10 pounds. Cystoscopy (Dr. Ballenger) negative.

On November 8, Dr. Ballenger reports "has passed no more blood. Cystoscopy about a month ago showed only a reddened place where the growth was. There has been a rather persistent cystitis."

CASE 3. Mrs. E. H. S., aged 54. Signs of malignancy: extensive tumor; vaginal induration as large as a silver dollar, sloughy in part. Microscopical diagnosis of papillomata; no fulguration.

History. Chief complaint, hematuria for the past year, and urinary frequency at night—5 to 20 times. Cystoscopy showed grape-like, red, partly sloughy tumor around the bladder neck. Vaginally there was an indurated area of the base of the bladder, nearly as large as a silver dollar. Specimen removed was reported as being papilloma (Dr. Ewing). Because of the induration, and because of the slough, I considered this carcinoma.

July 6, 116 mc. of radium in bladder neck for 6 hours. Reported one month later that she had a little discomfort in passing urine for a few days. She had gained 15 pounds in weight; got up but twice at night to urinate.

August 29, she still had tumor around bladder neck. 100 mc. of radium in bladder neck for 8 hours. She had no hematuria since the first radium.

October 30, 1916, reports she had no pain after the radium. Cystoscopy showed the tumor to be gone. She had gained 18 pounds in all. No induration of bladder base. Had no night urinary frequency.

CASE 4. J. A. H., aged 62. Signs of malignancy: tumor as large as a quarter; induration shown by cystoscopy; sloughy. Microscopical diagnosis of carcinoma; fulgurated twice, and tumor grown 2 or 3 times its original size.

History. Had two attacks of total hematuria, one month and eight days before seen. No night frequency; no loss of weight. Dr. Keyes saw by cystoscopy a red, lobulated, rather flat carcinoma above right ureter, burned it with high frequency and advised radium. The patient went to another physician, who fulgurated the tumor and decided against both operation and radium. About three months later he returned, when (with Dr. Keyes) a flat, sloughy in part, carcinoma was shown, two or three times the original size, extending from bladder neck to a point 2 cm. above right ureter. It had raised, thick, indurated edges. A specimen removed showed (Dr. Ewing) carcinoma. Two tubes of screened radium (one 90 and one 89 mc.) were left in his bladder 6 hours.

Two months later he returned, when there was seen redness of right side of his bladder, a small ulcer back of ureter (well away from where the tumor was), probably due to radium burn. *No other lesion was seen.*

Two months later there was a linear ulcer 1 cm. long, surrounded by puckered red mucosa on the anterior end of his original tumor. It looked like a recurrence, although a piece removed shows no carcinoma. Treated again by radium.

From results in these four cases it appears that radium can do as much as surgery for cases of bladder carcinoma without subjecting the patient to the danger and discomfort of a major operation. While these cases are entirely too few upon which to base any permanent deductions, I believe at the present time that the local removal of bladder carcinomata by radium depends upon two factors:

First, to get cases early enough, and, second, actually to apply the radium to the carcinoma.

Of the *twenty-one remaining cases,* eight have died, two as the result of transplantation of the ureters. Two are improving; one of these is a hopeless case, and one I have hopes of curing. Four I have not heard from since the irradiation, and the rest are too recently treated to report on.

These statistics are not brilliant, but one must remember that these twenty-one cases were all advanced carcinoma, and that all but one or two, in which a thought of cystectomy might have been entertained, were totally inoperable. A certain number of these hopeless cases were benefited by the irradiation. Some have gained weight, and in nearly all the hematuria has stopped. One patient, known to have lymphatic involvement beyond the bladder, came to me with a suprapubic opening (the result of an operation) as large as my index finger. Two months after one radium treatment, he had gained ten pounds in weight, his bleeding had entirely stopped, and his suprapubic wound closed; this notwithstanding the fact that his entire bladder was a mass of carcinoma.

INDICATIONS FOR THE USE OF RADIUM.

This brings us to the question, in what cases are we to use radium? I believe first that radium should be tried in all those cases in which we have reason to think the carcinoma is confined to the bladder, to see what the radium will do,—much as fulguration has been used as a diagnostic test of carcinoma. The second indication is hemorrhage from a bladder carcinoma. One dose of radium seems pretty consistently to check this symptom.

CARCINOMA OF THE PROSTATE.

From thirty cases of carcinoma of the prostate treated by radium since October, 1915, the following conclusions have been derived:

1. Radium treatment has caused with surprising regularity the reduction or disappearance of carcinomatous nodules of the prostate. Striking results have been obtained in both early and advanced cases. The early cases, those in which the carcinoma is fairly well confined to the prostate, and in which there is little or no perivascular infiltration, show shrinkage of the carcinoma. Very few advanced cases, those in which there is an enormous prostate, and in which the vesicles are hard and indurated, show any improvement.

2. The reduction which occurs in carcinomatous lobes is, as far as has been observed, permanent. One case has been followed for fifteen months, two for eight months, and more recent cases about a month or two after the reduction.

3. The symptoms in those cases in which the carcinoma had been reduced show striking improvement. This symptomatic improvement is shown in increased weight and strength, decrease in frequency of urination, and return of or improvement in erections.

One patient of 74 years, on whom a suprapubic exploration showed carcinoma of the prostate and who was treated but once with radium, gained eight pounds and reported five months later that he was then "doing a full day's work on steam boilers." He narrated, on questioning, that a full day's work was from 5 a.m. to 11 p.m.

Another who had no erections for 1½ years had a permanent return of this function. This patient, who had been invalided, gained 18 pounds, started in the mild work of shoveling snow and lifting ash cans, and now is doing a full day's work in a machine shop 16 months after his first treatment.

4. The technic of the radium application is as follows:

The emanations are placed in the end of a needle (gold or steel) extending from the tip 1½ inches along the sheath. These needles are 4 to 6 inches long, and are inserted through the perineum into the prostate or further into the vesicles. The perineum is anesthetized with 0.5% novocain and epinephrin, which makes the insertion practically painless. The needle is left in one lobe for six hours, and then changed to the other lobe. A finger in the rectum is used to guide the needle. Little or no pain is felt during the sojourn of the needle (12 hours), and the patient can either urinate or be catheterized. This means at most but twenty-four hours in the hospital; 50 mc. of radium are used in the end of the needle. Radium used in this way is practically unscreened, and the maximum effect of the radium takes place directly in the center of the carcinomatous nodule. The patient usually has pain in the prostate and urinary frequency beginning about 3 days after irradiation, and lasting a number of days to some weeks. In some cases in which I have used large doses the reaction has been severe. One has to be extremely careful about second or subsequent irradiations; the tissue seems to be much more sensitive to radium after the initial dose. Nearly all of my patients have been irradiated but once in two or three months, and no second treatment is given until the effect of the radium has entirely passed over.

5. The primary effect of the radium may be to increase the amount of residual urine (if there be any). The ultimate effect of the radium application on residual urine is probably nil, the amount neither increasing nor decreasing. Hence those patients who have chronic retention of urine require either the catheter or operation in addition to irradiation. It would seem wiser not to operate until the carcinomatous prostate had been thoroughly irradiated, and it would seem better not to operate at all if the patient can be trained to the use of the catheter.

6. No sloughs have resulted from the radium needles.

7. Radium apparently has a selective action on carcinoma. I conclude this from descriptions by Dr. James Ewing of carcinomata examined after radium treatment and from my own experience. I have used radium on an hypertrophied prostate with absolutely no effect, neither burning nor shrinkage occurring, yet the same amount of radium will markedly reduce a carcinomatous lobe. I have had a similar experience in a case of chronic contractive fibrosis of the corpora cavernosa.

8. The pathological examination of prostates removed after irradiation is of interest. In one case in which the prostate was removed because of urinary retention, a moderate dose of radium was given five months before the prostatectomy. The prostate had been considerably reduced in size following the radium treatment. At operation the prostate shelled out like a non-malignant adenoma. Dr. Ewing reported as follows:

"Material consists of several lobulated opaque portions of prostate, making a mass as large as a hen's egg. Much of this has the honey-comb appearance of chronic prostatitis. But some areas are very firm and solid. Two such areas, size of a bean, were sectioned. The main tissue of the gland shows lesions of chronic prostatitis with dilated glands and feeble epithelial proliferation. The solid areas show fibers of muscle tissue separated by rows of small epithelial cells with hyperchromatic nuclei. The appearance is that of diffuse carcinoma in a state of fibrosis. One area of adenocarcinoma is found in the center of a fibrosed area. There is no necrosis.

"In view of the history the diagnosis may be made of carcinoma, diffuse and adeno, arising on prostatitis, and undergoing atrophy and fibrosis from radium."

In another patient I gave one large dose of radium in August, 1916; the patient had a severe reaction. Five months later, because of retention, I took out as much of the prostate as I could. The pathological examination is as follows: (Dr. Ewing.) (Plates 1 and 2.)

"Portions of material, including a segment of urethra, received. They show subacute inflammation, hemorrhage and regressing changes in an alveolar carcinoma. The tumor alveoli are represented by groups of 5 to 10 epithelial cells with homogenous nuclei, clear cytoplasm, lying in dense fibromuscular tissue. Traces of these alveoli disappear in the exudate of round cells in many places."

It will be necessary to examine many more prostates which have been treated by radium before one can be sure that the above changes are due to the radium. The fact that carcinomatous lumps retrogress after radium treat-

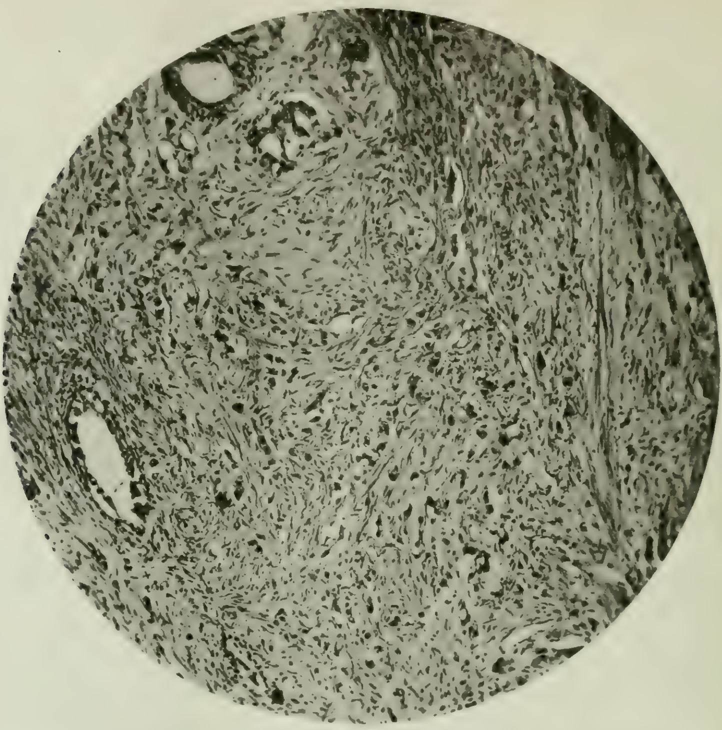

PLATE 1. Prostatic carcinoma undergoing fibrosis and atrophy from radium treatment.

ment is "corroborative evidence" that radium causes a fibrosis in the carcinoma.

9. As far as I have observed clinically all the cases treated are of about the same degree of malignancy. There is a class of cases of prostatic carcinoma, however, of much more marked malignancy. In these the primary focus in the prostate is often overlooked., and the patient comes to be treated for a secondary focus. There have been two such cases at the Memorial Hospital, in both of which there was a large carcinoma of the neck, and it was only by examination in one case and necropsy in the other that the primary focus in the prostate was found. Such cases are apparently very malignant, and it is a question if we ever get them early enough for any treatment to count.

10. Very large carcinomata with cachexia and loss of weight are beyond radium or any other treatment.

11. Only time will tell us whether any of our patients have been cured. At the present time we can state that in fairly early cases a marked regression of the prostatic lumps, and in some cases a complete disappearance of these, has taken place. Accompanying this retrogression, the patients have improved in weight and bodily strength. Radium has done more for these cases than operation or any other known therapy.

SUMMARY OF PROSTATIC CASES.

Thirty cases of prostatic carcinoma have been treated.

Advanced Cases. Nineteen of these thirty cases were advanced, having either very large prostates or marked perivesicular involvement, or both. In four cases the carcinoma had directly invaded the bladder. In eleven of these nineteen a microscopical diagnosis of carcinoma has been made. Four of these nineteen have died. One is going rapidly down hill, one has been lost track of, but six months after a single treatment was reported as up and working. In three cases I have done a partial prostatectomy for retention after treating the carcinoma with radium. Two cases are distinctly improved. The remaining cases have been too recently treated to report, as it takes from four to six months to get any results from irradiation. The two improved cases are worth reporting:

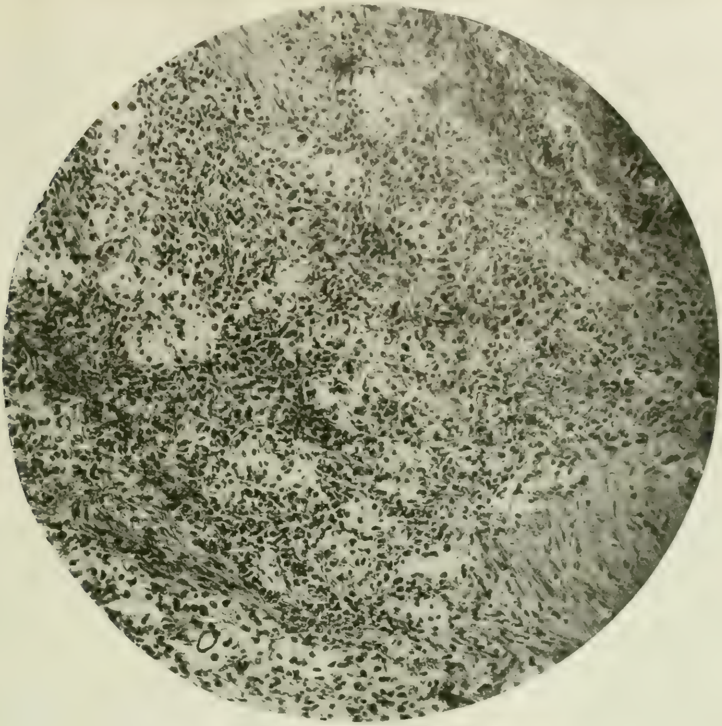

Plate 2. Prostatic carcinoma undergoing fibrosis and atrophy from radium treatment.

Case 9. M. H., aged 65.

History. Had a sloughy pendunculated carcinoma removed from neck of the bladder by Dr. Keyes. This grew from the prostate, no removal of which was attempted.. The pathological examination (by Dr. Ewing) was as follows:

"The section is from a piece of tumor tissue 0.5 cm. in diameter. It shows a solid carcinoma composed of small and large groups of compact tumor cells with a very little stroma. The cells are of moderate size, polyhedral, with hyperchromatic nuclei. The vessels are scanty. There is no necrosis. It is impossible to state from the section whether there is any infiltration of the bladder wall. In structure the tumor is that of a fully developed carcinoma."

June 6, the right lobe of the prostate, which had a hard ridge, was treated with 93 mc. of radium for six hours.

September 12, patient did not have to rise at night; he went from 4 to 6 hours without urinating; he had gained 15 pounds, and the lump in the right lobe was about gone. There was infiltration running up into the right vesicle. (Examination with Drs. Keyes and Jeck.)

March 1, he still showed some induration of the right vesicle. He was doing a full day's work and has lost no weight.

Case 10. J. B. B., aged 75.

History. Night frequency of urination, two to six times, for some months. Residual urine, 2 to 3 ounces. No loss of weight. Prostatic examination (Dr. Keyes) showed an extensive lumpy carcinoma running into both vesicles, a little higher on the right side.

June 6, 99 mc. of radium in his right lobe for 6½ hours and left lobe for 5 hours.

October 9, patient had a very severe reaction with much pain, lasting from 4 to 6 weeks. During this time he lost 12 pounds. Examination of the prostate (with Dr. Keyes) shows that much of the prostatic carcinoma is gone, periprostatic region was still carcinomatous, as is also the region of the vesicles. He looked in excellent shape and had regained his weight. I treated the remaining carcinoma with radium, not with any hope of curing him, but with the hope of stopping the growth for a time. In February he was reported as sojourning in Florida.

Early Cases. Eleven of the thirty cases were, roughly speaking, early carcinoma. This does not mean that they were suitable for operation. As a matter of fact, because of the initial success of radium treatment I believe that no patient with prostatic carcinoma should be operated upon. With one of the eleven cases there was a question of the diagnosis. One of the eleven died four months after prostatectomy from the effects of the operation and old age (82 years). Six of the eleven cases are distinctly better, and the remaining four cases have been too recently treated to report upon. The histories of these six are briefly:

Case 1. J. C. D., aged 59.

History. Chief complaint, loss of flesh and strength; night urinary frequency 3 to 4 times for 4 months. Pain in right thigh for 5 years. Prostatic examination (with Dr. Keyes) showed a large, hard, fixed, irregular prostate, each lobe about as large as half an English walnut; left lobe more prominent than right; little extension toward seminal vesicles. Radium treatment October 20, 1915; 50 mc. in left lobe 6 hours, and in right lobe a similar time.

November 17, 1915, reported that he had considerable burning after the treatment, and that he had a number of erections since (erections had been lost for 1½ years). Prostate felt the same.

January 14, 1916, he had gained about 10 pounds; felt fine. (Examination of prostate with Dr. Keyes.) There was a marked shrinkage of the carcinoma. Dr. Keyes said: "It is more the slight irregularity of the prostate that suggests carcinoma than anything else." I gave him 60 mc. of radium for 4 hours in both lobes.

January 31, 1916, he had gained 6 pounds more, making 16 in all, and had no pain from the radium; arose once at night to urinate.

February 18, 1916, not up at all at night to urinate; gained 2 more pounds in weight. Slight induration at base of the prostate, 38 mc. of radium in right lobe for 8½ hours.

April 4, 1916, .75 mc. in right lobe for 4 hours, then in left lobe 4 hours.

June 30, he had been working in the machine shop for 6 weeks, and had lost a couple of pounds. Had some burn after the radium, which has caused increase in night urination (3 to 4 times). In the center of the left lobe there was a small fairly hard lump, and a slight hard ridge in the right lobe.

November 17, weight the same. Working (sometimes 15 hours a day). A ridge in either lobe. I could not say whether or not it was carcinomatous.

February 12, examination of the prostate the same. Fine condition. Doing a full day's work. Again treated with radium.

Case 3. J. J. C., aged 71. Chief complaint is urinary frequency, chiefly at night (3 to 4 times) for the past 6 months, then acute retention. He had lost about 8 pounds in weight. Prostatic examination showed a flat, hard, irregular prostate, with prominent nodules at prostato-vesicular junction, extending into the vesicles. (Examination with Dr. Keyes.) Several other physicians examined the case and thought the diagnosis was not positive, but that it was very suspicious of carcinoma. 45 mc. of radium in right lobe for 7 hours, and in left lobe for 5½ hours (February 8, 1916).

March 17, 1916, reported not up at all at night to urinate, doing a full day's work and no pain at all after the radium.

May 23, the radium was repeated, after which he had pain and frequency of urination for a few days.

October 16 (examination with Dr. Keyes). Lost 2 or 3 pounds; is the picture of health. He had never been catheterized since beginning the radium treatment. Marrow fat pea at the right prostato-vesiculo-junction, nothing in vesicle or along upper border of prostate. There was a ridge along lateral edge of right lobe, not extending beyond the prostate; nothing in vesicles.

January 15, he had lumps at either upper margin of his prostate. If anything, they had slightly increased in size. He was doing a full day's work, and was in excellent condition. Again treated with radium, 62 mc. in right lobe 6 hours, and 6 hours in left lobe.

Case 6. W. C., aged 58. Chief complaint slight increase in frequency of urination (once at night). (Examination of prostate with Drs. Keyes, MacKenzie and Jeck.) Left lobe of prostate soft; right lobe hard, nodular, not large. Nothing in vesicles.

May 23, 50 mc. of radium in right lobe 11½ hours.

August 29, had pain after the radium, his symptoms were the same, and the prostatic carcinoma feels the same. 100 mc. of radium 4 hours in right lobe.

November 8, carcinomatous lump feels the same. He had some hematuria for 2 days. There was a slight irregularity of the lateral lobes of his prostate as seen by cystoscope. 102 mc. of radium in his urethra for 6 hours.

January 26, not up at all at night. Still working a full day. Prostate felt the same as when first examined. 64 mc. in right lobe 6 hours, and left lobe 6 hours.

February 13, the lump in his right lobe was apparently about gone. He had considerable burning after his radium, and he was now getting over the effect of this.

Case 15. A. S., aged 68. This patient was operated upon by Dr. Keyes in the spring of 1916 for hypertrophied prostate. Pathological examination of the removed prostate showed no malignancy. He came back to Bellevue in September with a hernia, upon which I operated, at the same time taking out a small prostatic lobe in the floor of his urethra. This proved to be carcinoma on pathological examination. He weighed 168 pounds before the operation. Rectal examination revealed a diffuse infiltration over the bladder base, with some slight lumps. (Examination with Dr. Keyes.)

October 17, 57 mc. of radium was inserted for 6 hours in the middle of his prostate.

December 4, had gained 20 pounds, erections had improved; he had a solid, hard lump at the apex (left) of his prostate; all the rest felt pretty soft.

January 16, 65 mc. of radium in left lobe 6 hours, and in right lobe 6 hours.

February 19 (examination with Dr. Keyes): His prostate felt irregular, but there was nothing absolutely characteristic of carcinoma. He is a veteran, and had offered his services to his country in the event of war. I also learned that he wishes to get married.

Case 17. H. C. A., aged 62. Chief complaints are urgency of urination, sometimes bleeding, and for the past year nocturnal frequency. Now he arises four times at night. His residual was one ounce, and his prostate was small, irregular and stony hard.

September 25, 50 mc. of radium in right lobe 4 hours, and in left lobe 4 hours.

January 31, he reported that he had considerable burning after the irradiation. He was now urinating 3 times at night, and by day every 2½ hours. He had ½ ounce residual urine. Prostatic examination (with Dr. Keyes) showed a little, hard lump beginning in the left center, and going to left lobe. Right lobe possibly a little irregular. A decided change from the first examination.

March 1, 50 mc. in right and 50 in left lobes for 6 hours.

Society Report.

NEW ENGLAND BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION. MEETING IN BOSTON, MARCH 13, 1917.

I. Presentation of Specimens, Instruments, etc., and Report of Cases.

Dr. Keefe: I wish to report a case of a woman about 52 years of age upon whom I did a hysterectomy for fibrosis six years ago. She presented herself stating that she had some trouble about the vulva and upon examination there was a mass there about as large as the first joint of your thumb. It was mahogany in color. She said she had had some frequency of micturition. I thought possibly there was some mistake about it, and it might have been a polyp growing from the cervical canal, with a long pedicle, which might have protruded recently at the vulva.

The day that she was etherized, as the assistant was about to catheterize, he said he did not find any urethra there. So then I examined and found that this had no connection whatever with the cervix. I could feel the cervix absolutely normal. On the under surface of this mass there was an opening and I was able to pass a catheter into the bladder. That was the opening of the urethra. It proved to be a case of eversion of the urethra. I was unable to reduce it by pushing the mucous membrane forward into the bladder. It was so dilated that I could pass my index finger into the bladder. I thought possibly there was a stone, but there was no stone there.

I wondered how to retain it, as I had never seen a case of that sort before. I finally thought of laceration through the sphincter ani muscle, so I made an incision on the under surface of the meatus and then went in with a tenaculum. I drew the muscle forward on either side and placed two sutures which pulled that circular muscle together more than it would be normally. Then I passed another catgut suture about the urethra. I passed it through the incision that I had made up to the right side, coming out above the meatus and then going through the same opening again, passed it on the left side and down. I introduced a good-sized probe and then tied my suture about that. Then I tied the two sutures that I had on the muscle and put about three superficial sutures in the mucous membrane.

This patient was in my office yesterday and she has had complete retention of the urine since we operated. It seems like a normal meatus and she has no difficulty at the present time.

Dr. Codman: I recently had a patient with a large abdominal tumor. She was a woman about 40 years old. The tumor extended from the epigastric region left of the median line downwards into the pelvis. You could feel it through the back. It had developed since last November, without pain or any other symptoms. She had a certain amount of what she called a crowding feeling after eating; but that was only what would take place mechanically from such a large tumor. She had had amenorrhoea for a year and a half.

Besides the tumor she had various anatomical peculiarities which were interesting. She had a partial hermaphroditism, with a well formed, small penis and breasts that were shrunken and almost like male breasts, with hair about the nipples and median line of chest, and also more or less beard. When she was shaved and you would see her dressed for the street, she had no masculine appearance at all, but was rather nice looking. Her elder sister told me that when the patient was a girl she had been rather masculine in her dress, tomboyish and very muscular and strong.

I asked Dr. Chute to see her in consultation. There was no abnormality of urine in any way, and I thought the tumor was probably renal. It was a question whether it was cystic or solid. Dr. Chute thought it was a hypernephroma. I operated, and if I had known enough I could have made a diagnosis before operation. I have spoken to a good many surgeons about the case since, and asked them to guess what it was. I think it would be interesting to ask if anyone here could make a diagnosis on what I have told them. It is quite possible to make a diagnosis in such a case. The only surgeon that I have asked about it who could make a diagnosis, was Dr. Kelley's assistant in Baltimore, Dr. Burnam. Well, it proved to be a malignant tumor of the adrenal body separate from the kidney. In looking up the literature I found that it was characteristic of some tumors in the adrenal to have these secondary sexual changes, particularly the hirsuties, which are supposed to be due to disturbance of the internal secretion.

Dr. Chute: I saw that patient, and I think Dr. Codman has neglected to say anything about the characteristic appearance of the tumor. It had that Indian pudding effect which seemed to me to be characteristic of the thing.

Dr. Codman: Histologically, Dr. Wright said that it was not a hypernephroma, although from its gross appearance it looked like hypernephroma. It did resemble exactly a baked Indian pudding.

Dr. Barney: I should like to ask if there was any change in blood pressure in that case.

Dr. Codman: None that I recall.

Dr. Tenney: I have here a stone I removed last week from a man 72 years of age. Six years before he had had a suprapubic prostatectomy. He had a rather miserable convalescence from this operation, and had not had comfort otherwise. The sound quickly found a stone in his prostatic cavity, and this was removed.

[Presentation of stone]

This other stone is from a man who had an x-ray plate at the Homeopathic Hospital in 1913. It was on the left side, showing a ureteral calculus. I saw him in June, 1916, and Dr. George took this plate, showing a decided change in the character of the ureteral calculus. It came out in fragments and it was possible to put a pair of Kelley clamps directly into the bladder. It was in the ureter and had not broken through the wall of the ureter. Usually the supposition would be that it would be outside, but as far as I could determine it was in the ureter itself. That is a rather striking change in three years.

His condition is all right now. He came to me a few days ago with a little symptom of obstruction on that side, and I was able to get a ureteral catheter in there about an inch.

Dr. Chute: I would like to present the report of a case with an unusual condition. Here is a kidney that I removed about a month ago in a woman 27 years old. Her history was that a year before that she began to have trouble. I sent her to the hospital and looked her over very carefully. The first thing I wanted was a radiograph and we took several. I passed a radiographic catheter up the left side and when the plates were developed we found nothing. We did that twice before we decided that it probably did not go up into the loin. Then by the fluoroscope we found that the thing was coiled up down below. It was evident that she had pelvic kidney and her trouble was that she had symptoms of mild pyelitis and a bad time at menstruation.

A month ago she came in and we went down retroperitoneally and this thing lay in the pelvis. The change had stopped probably about the seventh or eighth week in intrauterine life, and therefore the thing had not rotated. There was an accessory blood supply from the internal iliac and there was also a blood supply from, I should judge, the media sacralis. The operation was extremely hard because we could not go ahead with any degree of safety, but the patient has made a normal convalescence and has gone home well, with a good secretion from the kidney.

She was a young married woman who had been married about a year, and was very anxious to have children.

The kidney has not been opened, but I had a thorium injection, which does not show very much change from the normal in the arrangement of the calices. You can get an idea of them there. In the picture the big curve represents the ureter as it juts forward.

Dr. Barney: I have here a specimen of a tumor of the penis. This man was a freight brakeman 30 years of age, and he had no history of venereal disease or of injury to the penis. He said that two months before he had noticed a small red spot somewhat like a pimple, on the glans, which kept on growing slowly, but steadily. He had no pain but there was occasional burning and itching and that is all the thing amounted to. An examination showed that on the dorsal aspect of the glans there was an irregularly oval mass about 2 x ½ c.m. It was not tender and apparently not connected with the deeper structures. It had a peculiar purple color. There were no glands in the groin. The mass looked at first sight more like a hematoma.

I asked if he had had any injury, and he said there had been none.

I took it out with novocaine very easily. I cut down into the tissue of the glans and had very little bleeding, and finished with two or three interrupted catgut sutures.

I gave the specimen to Dr. Harry Hartwell, who made the following report:

"The specimen consisted of a flattened piece of tissue from the penis about the size of a small button. The microscopical examination presents some rather unusual features, and I have delayed some time waiting for specially stained sections before making my report.

The little tumor has replaced the epithelium and corium. It is made up of wide columns of small undifferentiated cells, with round, sharply staining nuclei and fairly abundant cytoplasm. These cell columns are separated from each other by wide blood vessels. The most striking characteristic is the presence of gland tubules of various sizes. They are lined by a single layer of cells, and are frequently widely distended with pale blue or eosin-staining, homogenous material. These tubules resemble very strongly the follicles of the thyroid. In other places there are structures which suggest the anlage of the sympathetic ganglia,—rings of small pyriform cells with fibrils radiating to a common center, the so-called rosettes which are found in neurocytoma.

"These characteristics suggest the origin of the tumor from different germ layers, and hence it may be classed as a teratoma."

I have looked the literature over fairly well, and I cannot find anything like this mentioned.

I have here a section of the tumor under the microscope in case anybody is interested.

Dr. Barringer: Did you consider it malignant teratoma on account of the pathological picture?

Dr. Barney: I should say that it probably was not malignant. It was excised last October, and enough time has not as yet elapsed to be sure.

Dr. Townsend: I would like to show a stone and plate. The stone I removed from the bladder of a man who had a suprapubic cystotomy two years ago, at which time a stone was removed. Following the removal of the stone, he got no relief from the operation. His pyuria persisted and also the vesical spasm. I cystoscoped him and found a stone attached to one of the inner diverticuli. A part of the stone broke off. This part I am showing was free in the bladder, and the rest of it was through in the diverticulum.

Dr. R. F. O'Neil, Boston: The calculus which Dr. Townsend has just shown is one of the so-called dumb-bell calculi, in which one-half of the stone is concealed by a diverticulum.

This morning, after doing a litholapaxy for a vesical calculus, on introducing the evacuator I was unable to get back as many fragments as I thought there should be. On cystoscoping the case, the orifice of a diverticulum about the size of the end of the finger was seen. This diverticulum had probably been concealed by the calculus at a previous cystoscopy. I was unable to evacuate the fragments from this diverticulum, so did a suprapubic cystotomy and removed them with forceps. The diverticulum was deeply seated, and its capacity was about an ounce. As the patient had been under the anesthetic for some time, no attempt was made to remove the diverticulum.

(Note.—The patient has since been discharged from the hospital with no residual urine, so it may be assumed that the diverticulum was not of great consequence.)

Dr. Crosbie: I was recently called out to St. Elizabeth's Hospital to see a man whom his physician had attempted to catheterize, without success: then the house officer had also tried, and he could not get any results. The man was about 50 years old and did not look a bit sick. He was a large, florid man with good color. His tongue was clean and mind clear. He had a large abdomen, and I was unable to feel an over-distended bladder. He gave a history of not being able to pass urine for three days.

I examined him by rectum, and found that the prostate was not enlarged. Following the examination, the patient passed two ounces of bloody urine. I then passed a catheter without difficulty and obtained no urine. The little urine he had passed was full of blood so that the examination of it was worth very little. I felt that the man was a malingerer. He was a freight handler, and I thought he was probably trying to work the insurance company.

I put him on forced fluids and observation. I saw him again early the next morning and he was feeling very well and eating breakfast. His chart recorded that he had passed 20 ounces of urine during the night, but I found later that that was a mistake in the chart. I left orders for him to be x-rayed. It was done and the x-rays were negative. His blood pressure, however, was 230. By evening of that day he had not passed any more urine, and at that time I found out that the record of 20 ounces in the morning was wrong. He was put in hot packs and fluids were forced. The next morning conditions were unchanged. Still he was not sick, and his tongue was clean, showing no signs of renal insufficiency. At that time it was five days since he had passed any urine to speak of. I catheterized both ureters and obtained no urine from either side. The patient still was not very sick. Dr. Chute saw him and he felt that he ought to have something done immediately, so the patient was etherized, and under ether we were able to feel a mass in the left loin.

Dr. Chute thought we ought to cut down on that side, and we found a tremendously enlarged left kidney, surrounded by a great deal of inflammation. In the first part of the ureter on that side a stone could be felt. The pelvis was opened and this stone was removed. Dr. Chute then did a nephrostomy so as to be sure to get free drainage. In removing the stone several ounces of turbid urine came out. The patient then was not in good condition, so nothing further was done. He was put to bed and given salt solution. That night his dressing was soaked, and during the next day. The day following the operation, the patient went into coma and died that night.

The kidneys were both removed, and it was found that both kidneys showed a chronic inflammation. The right kidney was much better than the left. The left kidney had been blocked off by this stone, but on the right side there was nothing at all to block the outflow of urine. Sections from the right kidney showed a chronic inflammation, but yet there was not the inflammation of an acute nephritis, in which the tubules are blocked with exudate.

It was apparently a case of reflex anuria.

As to the reason why the x-ray was negative—after we took the stone out Dr. Chute had it x-rayed by itself, and then in a small sac containing water. By itself the stone showed, but as soon as it was surrounded by fluid it did not show at all. That was apparently the reason why we did not find the stone in the x-ray examination. Chemical analysis showed the stone to be pure uric acid.

Dr. Chute: This case broke all my ideas to pieces. I had laughed about the reflex anuria. It seemed to me that it probably meant insufficient and inaccurate diagnosis, and yet when you see that kidney it is a pretty good-looking kidney.

It to me was very interesting, and the pathetic part of the thing is that I should probably do the same again under the same conditions.

We made a mistake, but I do not see how we could have helped ourselves under similar conditions.

Dr. Quinby: I want to call your attention very briefly to some cases which should have come in at the first part of your program.

There is something marvelous I think about the amount of stone formation which a kidney may contain and still show no symptoms. This first case occurred in a woman of 54 years, and was found only on investigation by her doctor, who was seeking for a cause of suppuration. She had complained of some rheumatic pains in one knee joint and had her teeth x-rayed. It was finally discovered that she had that stone in the pelvis of her kidney. She was absolutely without symptoms. It showed only in the x-ray, without making itself manifest in the urine, which contained no casts and no blood. The function of each kidney was 15% in three-quarters of an hour. The stone fitted the renal pelvis quite snugly.

There was a similar case, rather more marked in extent, in a man who applied for a life insurance. He was told that he had a pyuria. I removed that kidney, which had only about 5% function, in comparison with the other side, which showed possibly 35%. These two cases would compare with each other.

One other is that of a boy whose urine was negative entirely, and from his history one might have supposed him to be of a neurasthenic type. He complained of pain in his left hypochondrium. It was found on examination that the left kidney was possibly one-fifth the value of the right. Using thorium under gravity, this picture was produced, with the ureter somewhat dilated. Using a little more pressure, a different picture was produced. At operation his kidney showed the embryological destruction of blood vessels, one at either pole.

II. Paper by Dr. Barringer—Radium Treatment of Carcinoma of the Bladder and Prostate.*

DISCUSSION.

Dr. Duane: It gives me very great pleasure to open the discussion on this interesting paper which Dr. Barringer has just presented to the meeting.

There are two points which have interested me very much in his talk. in the first place, the fact that he is treating these prostate tumors or carcinomata from the inside rather than from the outside, by inserting the active substance into the mass of the tumor itself. In all cases in which this is possible, it seems wise to do it. It seems from a scientific point of view the proper thing to do; for if you radiate the tumor from the inside, so to speak, you are radiating the tumor tissue much more strongly than the normal tissue around it. If you attempt to do it from the outside, of course the normal tissues surrounding the tumor get more radiation than the tumor itself.

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* See Journal, p. 444

The second point which impresses me is the fact that Dr. Barringer is treating these cases himself. That is not always so in radiotherapy. It is apt to be the case that the surgeon in charge will give the actual treatment to an assistant or put it in the hands of nurses. That has been done to a very great extent, and I am very glad to hear that Dr. Barringer is actually making the applications himself.

At the Huntington Hospital, according to the report that the Cancer Commission published for the year ending on the first of July last, the commission has treated some 500 cases during the year with radium, cases of malignant growths; but of those 500 cases only one was a case of carcinoma of the bladder, and only three were cases of carcinoma of the prostate; so that the number of cases that we had is so small that it does not seem to be worth while for us to make any particular statements or draw any conclusions; and I shall, therefore, confine my remarks to a few general statements regarding the principles of radiating tumors with radioactive substances from the inside, and showing you a few of the instruments that we use for this purpose.

[Slides]

The first slide that I have to show you represents the methods that we use for inserting the radioactive substances into the center of tumors. We make a sort of extract from the radium (this extract is called radium emanation), and compress it into a little glass tube that you see at this point. These glass tubes may be inserted through this trochar into the tissue and abandoned there. The radioactive substances gradually transform themselves, half the radioactive substance disappearing in about four days, half of what is left in four more days, etc., so that by this method, a prolonged radiation, lasting for a number of days, may be obtained. A correspondingly small amount of the active substance, of course, is used. These long, thin metal tubes with sharp points on the ends represent metal needles, in the tips of which are placed the tiny glass tubes containing the emanation. These are used for inserting the active tubes into the tumor, when it is desired to withdraw the activity after a few hours' treatment.

It is very important to know just how penetrating the rays that come from an applicator are. The curves of this second slide represent two extreme cases. They have been drawn from experiment. The upper curve represents the absorption of the rays in water; they have already passed through about two millimeters of lead as a filter. It is evident from the curve that the radiant energy passes several centimeters through water before the radiation has been reduced to one-half its intensity. The lower of the two curves represents another extreme case, *i. e.*, that in which there is scarcely any filtration. In this case, as you see, practically all the energy is absorbed before the radiation has penetrated more than four or five millimeters through the water. The absorption by soft tissues is practically the same as that by water.

In the case of the surgeon, he is the man who decides what is to be done, and he is the man who actually wields the knife; and it seems to me that in radiotherapy the man who decides what to do should be the man to make the applications, because radium is a very much more complicated physical agent than a knife is, and requires a good deal more skill to manipulate than a knife does.

I think you will join me in extending thanks to Dr. Barringer for coming here and delivering this paper tonight.

Dr. Crosbie: There was one point I did not quite understand, and that was regarding the change that the carcinomata undergo after the treatment by radium. Dr. Barringer mentioned that certain alveoli were breaking down. My impression was that the ordinary prostatic carcinomata are not made up of alveoli, but, rather, solid masses of epithelial cells, so I did not see what changes of the alveoli would mean.

Dr. Chute: I was very much interested in Dr. Barringer's paper, although I have had no experience in this line. It teaches us one thing, and that is that you have got to be careful about drawing conclusions. There are a number of cases in which the natural history is slow. Any number of these cases run from two to five years after you have proved them clinically. Those that are clinically carcinoma and microscopically carcinoma get along very well for a long time. It is hard to draw conclusions.

Early in February I saw a man whom Dr. O'Neil and I operated on just four years ago. That man had a very marked clinical carcinoma of the prostate. He was very uncomfortable and we took it out. He has had three years and four months now of practical comfort, and his condition was, as I remember it, much as before, so that I told the family I thought we could give him the same relief that we had before.

Another case is apparently well after five years. While a good many carcinomata do not run that length of time, there are some of them that are really very tolerant.

I have had absolutely no experience, however, with the radium treatment.

Dr. Smith: I can say absolutely nothing about the radium treatment either, but it seems to me that if we have here a substance which will do the same thing that an operation will do, it is vastly better, particularly in these cases of infiltrating carcinoma of the bladder.

If you can give them an extension of life with pretty comfortable existence for even ten months, it is well worth following the thing through to the last analysis.

I have been very much interested in Dr. Barringer's paper, and wish to express my appreciation of it.

Dr. R. F. O'Neil, Boston: I am very much interested in this paper of Dr. Barringer's, and I am sure we are very much obliged to him for taking the trouble to come on and give it to us. I think some of the results are very strikingly encouraging. I also think that it is a line of work which we should pursue here in Boston, if possible, and with the facilities and coöperation of the Huntington Hospital, I think we will be able to do much more than we have in this field.

I should like to ask Dr. Barringer if he has heard any of the results from the Johns Hopkins Hospital in Baltimore. I was there a short time ago and saw some of their cases, in which apparently there had been symptomatic and local improvement. Their method of the application of radium differs from that used by Dr. Barringer. They employ various types of modified cystoscopes for intravesical application; also make applications by rectum. It seems to me that the principle employed by Dr. Barringer, of introducing a needle into the growth without affecting the surrounding normal tissues, has a great deal to recommend it.

Dr. Codman: I would like to speak of a case of an enormous tumor which I operated on last year, and which Dr. Duane was kind enough to help me treat with radium. This case entirely changed my point of view about radium. I had been rather skeptical before.

This patient had a tumor that was absolutely inoperable. It extended two inches above the umbilicus. It was a firm, fixed thing, somewhat elastic. It involved all the pelvic organs so that I could not see the uterus or make out the position of the adnexa at all. I removed a piece of the tumor and sent it to Dr. Wright for pathological examination, and he reported that it was a form of carcinoma. It showed a finely divided microscopic calcareous material.

I thought it was absolutely inoperable, but I racked my brains to think of what I possibly could do to relieve the woman. I thought perhaps I might introduce radium into the center of this thing. I closed the abdomen so that the tumor lay next to the abdominal wall, and then I sent the members of the patient's family to consult Dr. Kelley in Baltimore and Dr. Clark in Philadelphia, and also I consulted Dr. Greenough here in Boston. They all felt that it was justifiable, so I made an incision again in the old incision and cut into the thing. It was perhaps ½ or ¾ inch thick, firm, cartilaginous, filled with bloody fluid. It was multilocular. The fluid was thick and dark.

After some difficulty I got my instruments through from abdomen to vagina. It was a very serious operation. I put through a tube about as big as an ordinary garden hose pipe and inside of that tube I put a fenestrated tube so arranged that I could keep the thing clean and irrigated, and then Dr. Duane and Dr. Greenough were kind enough to let me use the radium of the Huntington Hospital, through the tube.

This main mass of tumor has gone away and the woman is practically well and has gained weight. There is a mass perhaps as big as a fist in the pelvis at the last examination. She has kept up the radium treatment at intervals, and, unfortunately, at the last treatment she got a bad superficial burn. Instead of the tumor there is now a soft, flaccid wall. The uterus is freely movable, and you can feel the adnexa and a mass which may be partly inflammatory.

I am a convert to the radium idea, and I think that may help back up Dr. Barringer's assertions on the prostatic cases.

DISCUSSION.

Dr. O'Neil: I would like to ask Dr. Barringer if he has had any returns from the Hopkins in Baltimore. I was there not long ago and found their method rather different. They showed me some cases which were certainly wonderful, where the masses had subsided and the patients had been improved, with a reduction of hematoma and difficulty of micturition, etc.

They were not over-enthusiastic, but still they had some goods to show.

Dr. L'Esperance: I am interested in the treatment with radium of the condition of chronic circumscribed inflammation of the corpora cavernosa, and I would like to know what are the results obtained with this treatment. We recommended a patient to the Huntington Hospital, and he returned to us a short time afterwards with a rather severe burn and no improvement of the fibrosis.

I would like to know what Dr. Barringer's experience has been in that line of work.

Dr. Barringer (in closing): I am sure I am greatly indebted to the members of the Society, and especially Dr. Duane, for their discussion on this rather intricate subject.

To answer these questions *seriatim,* I will say to Dr. Crosbie that I am not a pathologist. As I understand it, the alveoli are the carcinomatous parts of the prostate, and when these alveoli break up, when they show disintegration, it looks as if they were undergoing some sort of retrogressive changes. As I said, I do not think these few cases prove anything; they simply are suggestive.

I entirely agree with Dr. Chute that carcinoma of the prostate is, in most cases, a long disease, but in all these cases, if you bar operation for carcinoma of the prostate, we see a progressive going down hill. They lose weight and are very apt to get up irritating symptoms, and each time you examine the prostate you will find a new enlarging lump and new lumps going up the vesicles. At least, that has been my experience. Removal of a carcinoma of the prostate is a very severe operation, entailing cutting off the neck of the bladder, dissecting out the seminal vesicles, cutting off the urethra and stitching the urethra to the bladder. If the operation itself is successful, the after-effects are very apt to be unsuccessful in the fact that the carcinoma is very likely to return, and the patient has partial or complete incontinence of urine. The results have been so bad that most surgeons do not operate in these cases.

At the Johns Hopkins they have not operated in two or three years to take out a carcinoma of the prostate. The patients treated by radium increase in weight and the cancerous lumps go down, not wholly or completely, possibly, but they are distinctly smaller. Whether any of them are cured I doubt. I think, however, we can say that we have achieved a retrogression in the carcinoma. I am sure we have added a few months to these patients' lives and certainly a few months to their happiness and working power. In the first case that I reported the patient has worked nearly a year now.

In carcinoma of the bladder the operative statistics are probably considerably better than those in carcinoma of the prostate. On the other hand, in these four cases that I presented tonight I believe that we have done as much with radium as you can do with an operation, and they have not been subjected to a major operation. Certainly in one of these cases we should have had to reimplant the ureter. In these patients who are so poorly equipped to endure surgery because of their age, one or two radium treatments have done all that an operation could do.

As to the Hopkins results, I hear various reports from them. I think they give very good returns in their carcinoma of the prostate. I have not used the method that they use there, that is, irradiation by means of rectum and urethra, rectum two-thirds and urethra one-third, because it seemed to me it was so easy to put the needle right in the middle of the prostatic lobe. I may change later to the Hopkins method, but I am going to try my way for a while longer, as it seems worth trying. The only case that I have seen treated by radium rectally was treated by a man who knows much more about radium than I do. This was a carcinoma of the prostate, and the patient got up rectal symptoms, tenesmus and irritation. He went on from bad to worse, and finally died uremic. I think he died from the radium burns. They cause considerable toxemia,—enough to be capable of killing a patient. I recently saw a case of carcinoma of the uterus where there was a slough of the uterus, bladder and vagina caused by radium. That patient died of slough from radium, and not from carcinoma.

You have got to be extremely careful to treat very lightly and gently, as radium goes much deeper than we suspect.

I think the Hopkins reports on carcinoma of the bladder have been rather unfavorable. I do not know why they have not been effective. Perhaps they have had late cases. It does not seem to me that placing the cystoscope in the bladder and holding the radium against the tumor is effective. It does not seem that you can give a long enough burn materially to affect the tumor.

Cases of chronic contractive fibrosis of the corpora cavernosa have troubled us some. I recall one of a man who got a slough of the surface of the penis considerably away from where the radium was. It was nearly healed when I last saw him, but the fibrosis was going merrily on its way.

Book Reviews.

The Medical Clinics of Chicago, January, 1917. Philadelphia and London: W. B. Saunders Company.

In this number eleven clinicians take up a wide variety of topics. Of particular interest is an excellent summary of barium diagnosis by Dr. Case. A case of true amebic dysentery developing in Chicago is also briefly recorded. The other discussions conform to the general plan of previous numbers.

Manual of Chemistry. A Guide to Lectures and Laboratory Work for Beginners in Chemistry. A Text-Book Specially Adapted for Students of Medicine, Pharmacy and Dentistry. By W. SIMON, Ph.D., M.D., Late Professor of Chemistry in the College of Physicians and Surgeons of Baltimore, and in the Baltimore College of Dental Surgery; and DANIEL BASE, Ph.D., Professor of Chemistry in the Maryland College of Pharmacy, Department of the University of Maryland, Baltimore. Eleventh edition, thoroughly revised. With fifty-five illustrations, one colored spectra plate and six colored plates representing forty-eight chemical reactions. Philadelphia and New York: Lea & Febiger. 1916.

This well-known volume has now appeared in its eleventh edition with many improvements. There could be no greater monument to its distinguished and well-known author, who first presented the work for preparation in chemistry for medical and dental students. At the time when no preliminary scientific education was demanded of such students, it proved the most satisfactory of all works of that character.

Under the direction of Dr. Simon's co-author, the present revision has been made to comply with the present-day requirements of those of whom preliminary scientific education is not demanded.

The section on physics has been omitted probably in conformity with the changes in medical education previously mentioned. Though the section on metals has been revised and improved, we still think that it is too extensive and includes many metals which have little or no importance in a purely premedical course in chemistry, though undoubtedly very essential in the consideration of chemistry as a science. Both qualitative and quantitative methods have been discussed in the work and evidently with a fullness necessary for the limited scope of the book.

The section on organic chemistry is quite complete and furnishes all that is necessary for beginning the study of biochemistry.

Were the work to cease at this point, we could heartily commend the program laid out by the authors. The attempt at the discussion of proteins, however, with our enormous knowledge existing at present, is so brief and incomplete that it acts as a blot upon an otherwise admirable volume.

Just what part this work is to play in future medical education is hard to say, but apparently it must be restricted to the so-called premedical course which is given temporarily by medical schools in preparation for the further study of medicine.

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RECONSTRUCTION HOSPITALS.

In previous issues of the Journal, mention has been made of the plan of the Surgeon-General to establish reconstruction hospitals throughout the United States, where crippled soldiers may be treated and prevented, to a large extent, from becoming handicapped or helpless because of their injuries, and, in particular, mention has been made of the project to build such a hospital on Parker Hill, Roxbury.

It is the understanding—though no order has been issued—that the Boston Unit "Reconstruction Base Hospital No. 1" is to be the first to be built, isto be built very soon, and is to serve as a model and experiment station for the rest. The plans, prepared in detail for this hospital, are now being gone over in Washington with a huge standardization of all these hospitals for the whole service. A standardization of special equipment for mechanotherapy, etc., and for the scheme of enrollment and assignment of physical therapeutists, including masseuses, is being pushed forward and the standardization of splints and other apparatus of the sort, a very important matter, is pretty well worked out. As we see the size of this problem presented, the problems of organization and standardization become more important than they seemed for the smaller and possibly more or less independent units. This has led to a certain amount of delay, but at present organization, even as to details, is going forward at a rapid rate. It is worth noting that the reorganization, in so far as it affects reconstruction work, not only has the coöperation of the regular medical corps of the army, but that surgical advisers, as well as the orthopedic advisers, including such men as Dr. William Mayo, Dr. J. F. Binnie, and Dr. Dean Lewis, and others, understand and are in favor of this reorganization. It is worth noting that this reorganization, for the first time in this or any other country, takes cognizance of the necessity for the supervision of the patient, from the receipt of the injury to discharge, during all of which time the Department of Military Orthopedics is responsible for him, provided he comes within the classification as listed for reconstruction work of this type. This means vast changes in administrative detail, but seems important, and this policy is to be followed, not only in regard to reconstruction along the lines of surgical orthopedics, but in other specialties.

Major Elliott G. Brackett, of Boston, who has been appointed director of this new "Department for Military Orthopedics," estimates that with a million men in the field there should be fourteen units in this country, each with a capacity of 500 beds, capable of being enlarged to 1000 beds, besides extensive accommodation abroad. Aside from the problem of construction and administration of these hospitals, it will be necessary to train physicians to operate them. The little nucleus of highly skilled orthopedists in America will be in charge of the teaching, the men next in rank will follow and the chief numbers are already being recruited from among the doctors of good general surgical experience. Such organization and training of men in reconstruction work, is not only a war measure; in times of peace the training received by this means will be of invaluable service in the correction of accidents and injuries received in industrial lines. State Industrial Accident Boards are already watching the progress of this work with much interest.

Few activities stimulated by the exigencies of war and developed under its harsh incentive, promise more as an opportunity for the science of the medical profession to make itself a yet more effective agent in ministering to the welfare of men.

MEDICAL NOTES.

A Milk-Borne Outbreak of Typhoid Fever on Staten Island.—On Saturday, September 1, the New York Health Department's Diagnosis Laboratory reported to the Typhoid Division, four positive Widals from the Borough of Richmond. For that borough, this was an unusual number and at once attracted attention. A cursory investigation showed three of these cases used the milk supplied by the same local dealer. Through the Milk Division of the Bureau of Food and Drugs, information was at once obtained as to the source of this milk, and this done, orders were issued to exclude further shipments of this particular milk, pending further investigation. In a day or two the number of cases recognized and suspected, that came to the notice of the Department of Health, assumed the proportion of an epidemic, and from that time until now (September 18), when the last case was reported, the number of cases reached 72. Of these, at least 65 were traced, directly or indirectly, to the one milk supply already referred to. A thorough investigaton of the source of the milk failed to reveal any clue to the possible origin of the infection. Furthermore, the other points to which the same milk was shipped did not show any increase in the number of cases of typhoid fever. Patient inquiry among all who had possibly come into contact with the milk, finally showed that an individual employed by the firm distributing the milk in Richmond had in his family two active cases of typhoid with which he came into intimate contact. On one or more occasions, this individual acted as the direct conveyor of the infection.

This source of infection has not been operative since September 8th, when the individual concerned was forbidden to engage in any food handling occupation. Inasmuch as the milk supply as such was not at fault, permission to resume the distribution of this was given on September 16th. No new cases belonging to this group have been reported with onsets later than September 9th.

Increase in Number Killed by Automobiles.—The startling fact that the death rate from automobile accidents has more than tripled since 1911, is disclosed by a study of the deaths among the industrial policy-holders of a large insurance company. In 1911, the death rate from this cause was 2.3 per 100,000; in 1916, it had increased to 7.4. During this period the rate for each year was markedly higher than the rate for the year before, and that for 1916 showed an increase of more than 37% over the figure for 1915.

The steadily climbing death rate from automobile accidents among the families of the country's wage-earners is due, very largely, to fatalities among little children. This investigation has developed the fact that of the 2,507 policy-holders who were killed by automobiles during the six years, 1911-1916, no less than 790, or about 32%, were children under 10 years of age, and 1,125, or over 44%, were children under 15 years of age. Unless something is done to check automobile fatalities, the time is approaching when the automobile as an instrument of death among children will become as serious and dreaded a factor as some of the deadly epidemic diseases upon which the attention of health authorities has long been centered. There has been in recent years a marked decrease in the death rate from such diseases as measles, scarlet fever, whooping-cough and diphtheria, but the rate for automobile accidents (surely as preventable a cause of death as any of these) is increasing by leaps and bounds.

Another condition developed by this study is the fact that as far as the industrial population is concerned, more deaths are caused by automobiles than by surface cars, subway trains, elevated trains, bicycles and horse-drawn vehicles combined. Indeed, in 1916 the 756 deaths caused by automobiles approaches very closely the 799 persons insured in the company, killed on steam railroads.

The figures for policy-holders, it must be borne in mind, represent, almost exclusively, pedestrians, rather than those who ride in the machines. This is particularly true of the children. A large part of this mortality, it is evident, is due to reckless driving and to the heedlessness of children to the dangers to which they expose themselves. But whatever be the cause, it is clear from these figures that the automobile is an important agency of death and that its control by the community must be immediate and thorough if improvement is to be made.

Rapid Growth of the Birth Registration Area.—Maryland, Virginia, and Kentucky are the latest states to be admitted to the Registration Area for Births by the Director of the Census.

The Registration Area for Births was established in 1915, and was then composed of ten states and the District of Columbia, representing 10 per cent. of the territorial extent of the United States, but containing 31 per cent. of the country's population. For this area, the Bureau of the Census has recently issued its first annual report, entitled "Birth Statistics." As the area grows, the annual reports will deal with the births in a constantly increasing portion of the country and will, therefore, become of constantly increasing interest and value.

The outlook for a very rapid growth of this Registration Area for Births is so good that a word of cheer to the states outside should be given. The need of complete birth registration is recognized now as never before. The age of the soldier must be known, and so a new argument for birth registration comes to the United States. Since war was declared, tests of the completeness of birth registration have been made by special agents of the Census Bureau in Virginia and Kentucky, and both these states secured a rating of over 90 per cent., which represents the degree of completeness required for admission to the area.

Similar tests are now being made in Indiana and New Jersey, and before the year is over will be conducted in North Carolina, Ohio, Utah, and Wisconsin. Several other states are nearly ready to seek admission, and it is by no means a wild prediction that the Birth Registration Area within the next two years will be more than trebled in size, and will contain over two-thirds of the population of the United States.

WAR NOTES.

Ambulance Service in France.—Word has been received from France that the Red Cross Ambulance Service and the Harjes-Norton Service have been taken over by the United States Army. Volunteers for these services will now be obliged to make application to the Surgeon General of the Army. Col. Kean is in charge of the services and, it is reported, plans to enlist the rank and file as privates in the United States service, with the probable intention of offering section leaders the rank of lieutenant. Enlistment, as in other branches of the service, is for the duration of the war.

Appointments.—The appointment of Dr. Alfred G. Coffey of Nashua, N. H., as first lieutenant in the United States Medical Reserve Corps, is announced. Dr. Coffey is a graduate of Tufts Dental School.

Dr. James H. Keith of Brockton, Mass., has received his commission as first lieutenant in the Dental Reserve Corps. He is a graduate of Tufts Dental School.

Enlistments in Medical Corps.—Since Lt.-Col. James F. Hall began the organization of the medical units in the northeastern department about 2700 men have been recruited. These men have all been called from the Reserve Corps into active service. The psychiatric unit, under the direction of Dr. L. Vernon Briggs, is examining the National Guard for nervous and mental disorders and is employing the services of contract surgeons to make the examinations. The medical corps school at Allentown, Pa., has 500 men from the northeastern department under instruction for ambulance service.

Death of Edward Revere Osler.—The death is reported of Edward Revere Osler, only son of Dr. Sir William Osler and Lady Grace Revere Osler, who was formerly of Boston. Lt. Osler was in the Royal Field Artillery, and received wounds, on the western battle front, on August 30, which resulted in his death. He was born in Baltimore, Md., in 1895, and was an undergraduate in Oxford when the war began. In June, 1915, he enlisted in McGill University Medical Corps, where he remained until the spring of 1916, when he was transferred to the artillery. His mother was formerly Miss Grace Linzee Revere of Boston.

American Women's War Hospital.—An analysis of the cases treated at the American Women's War Hospital, South Devon, England, has been published by Major D. Pearce Penhallow, chief surgeon, and covers the period of time from August 20, 1916, to May 29, 1917. During this time one thousand cases were treated. Of this number 650 were surgical cases and 350 medical cases. Of the surgical cases 60.76% were cured, 37.4% were improved, and 1.54% were unimproved. Of the medical cases 34.3% were cured, 62.85% were improved, and 2.28% were unimproved. The average time for discharge was 50 days. The American Women's War Hospital at Paignton, South Devon, is the first and principal expression of the work of the American Women's War Relief Fund which was initiated immediately on the outbreak of war as a token of sympathy with Great Britain in her time of trial. Dr. D. Pearce Penhallow of Boston has been made chief surgeon and, although he has recently been commissioned a major in the Medical Reserve Corps, United States Army, the work of the hospital will continue as formerly.

Children in War Time.—War work for babies, which resulted in lowering the infant death rate in Great Britain, France, Belgium, and Germany, is described by Dr. Grace L. Meigs of the Children's Bureau of the U. S. Department of Labor, in a paper on Infant Welfare Work in War Time, which the bureau has just made available for general distribution.

The special features of the work have varied in the different countries. In England there has been a striking increase in the number of health visitors employed to help and to instruct mothers in the care of their babies and young children. An act providing for Government aid to local agencies had, as it happened, been passed in July, 1914.

"The Local Government Board (the central supervising and administrative body) has taken the stand that in war time, in spite of the general need for economy, no economy should be exercised in this direction. There is evidence that in a good many communities, on account of lack of money and prvate support, the authorities or voluntary agencies have been slow to increase their work or to undertake new work. These difficulties the Local Government Board has largely overcome. It has gone on with the greatest determination towards its acknowledged goal—to have systematic supervision through the work of health visitors for all babies born who need care."

The available information for Germany concerns only the first 18 months of the war. Dr. Meigs refers to the emphasis placed on enabling mothers to care for their own children. A special committee of the Red Cross, for example, was organized in Berlin for the care of mothers and infants. The committee had a fund for needy mothers which it used for those mothers who brought their babies regularly to an infant-welfare station and who took care of them in their own homes.

The outstanding feature of the work in Paris seems to be the increased provision for maternity care; and in Belgium, the establishment of canteens for the feeding of mothers and of young children.

Dr. Meigs speaks of the important part played by the military separation allowances which are granted by foreign Governments to the wives of enlisted men, either, as in Great Britain and Canada, to the wives of all soldiers or, as in France and Germany, to the wives who are in need because the family's wage-earner has been called to the colors. Furthermore, in each of these countries except Belgium, a maternity benefit from Government funds, provided before the war to certain mothers, has now been extended to include either the wives of all enlisted men, or all women who are receiving the military separation allowance.

Dr. Meigs bases, on the experience of these countries, the following practical war-time suggestions for the United States: The chief preventive measure of protecting babies, is to insure their intelligent care and nursing by healthy mothers in their own homes. Nothing should be considered more important in war time than the strengthening and extending of preventive work already established for infant and maternal welfare. The disorganization of such work through the loss of physicians and nurses especially trained for it, should be avoided if possible. Every effort should be made to enlist a large number of candidates for hospital training courses.

Hospital Unit from Virginia.—The first expenditure of the $1,000,000 war relief fund of the Elks' war commission, will go to equip a hospital unit to be sent from the University of Virginia. The total cost will be $60,000. This war relief fund was voted by the Elks' Grand Lodge at its recent Boston session.

Transfer of American Ambulance Hospital.—Upon the transfer of the American Ambulance Hospital of Paris to the United States Army, the name of the institution was changed to American Red Cross Military Hospital No. 1. Those of its staff who were in the Medical Officers' Reserve Corps were placed on active duty and ordered to continue service, while others have been commissioned and retained. Major George P. Reed of the Medical Corps, U. S. A., is in command.

Organization of Reconstruction Hospitals.—Surgeon-General Gorgas has chosen nineteen cities of the country as sites for the new reconstruction hospitals. The hospitals at Boston, New York, Washington and Chicago will probably be the first built. Others will be built at Philadelphia, Baltimore, Buffalo, Cincinnati, St. Paul, Seattle, San Francisco, Los Angeles, Denver, Kansas City, St. Louis, Memphis, Richmond, Atlanta and New Orleans. Each will have equipment for five hundred beds with provision for doubling this capacity if required.

War Relief Funds.—On September 23 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund ...	$253,040.00
Children's Relief Fund ..	218,334.85
Surgical Dressings Fund	123,505.85
French Phthisis Fund ...	68,983.00
Italian Fund	44,492.72

BOSTON AND MASSACHUSETTS.

The Week's Death Rate in Boston.—During the week ended Saturday, Sept. 15, 1917, there were 206 deaths reported, against 216 the corresponding week of last year. The death rate was 13.19. The number of deaths under one was 50, against 50 last year.

The number of cases of communicable diseases was as follows: diphtheria, 52; scarlet fever, 9; measles, 22; typhoid fever, 7; tuberculosis, 56.

Included in the above were the following cases of non-residents: diphtheria, 7; scarlet fever, 3; tuberculosis, 2.

The number of deaths of communicable diseases was as follows: diphtheria, 2; scarlet fever, 1; typhoid fever, 1; tuberculosis, 19.

Long Island Hospital.—The twentieth annual report of the Long Island Hospital, Boston Harbor, records that the average population for the year was 954, a decrease of 60 from the previous year. Thirty children were born at the hospital, and the possibility of remodeling the old nurses' home into a maternity hospital is being contemplated. The new nurses' home and two new ward buildings have been completed and will be occupied as soon as furnishings can be provided.

Meeting of Instruction for Health Officers. A four days' meeting for instruction of health officers was held in Boston from September 4 to 7, inclusive. The meeting was held under the auspices of the Committee on Public Health of the Massachusetts Medical Society, with the coöperation of the State Department of Health, the Massachusetts Association of Boards of Health and the United States Public Health Service.

The morning session of the first day was held at Massachusetts Institute of Technology. Edward A. Ingham, C.P.H., gave an illustrated talk on the elements of bacteriology. Surgeon J. W. Schereschewsky of the United States Public Health Service contributed a paper on "Vital Statistics: Their Practical Value to and Use by Health Authorities," and another on "Industrial Hygiene from the Standpoint of the Local Health Authorities."

The afternoon session was held at the laboratory of the Board of Health of Arlington, with Dr. Merrill E. Champion, State District Health Officer, H. W. Hamilton, S.B., Sanitary Research Assistant at M. I. T., and Dr. Ezekiel Pratt, director of the Arlington laboratory, as speakers.

The morning session of the second day was held at Tufts Medical School, and addresses were made by Dr. Champion and Miss Mary Beard of the Instructive District Nursing Association. The afternoon session was held at Massachusetts Institute of Technology, where problems of sewage and garbage disposal and water purification were discussed. The third day was spent at the Boston City Club, and the milk problem was the topic, and at Evans Memorial Hall, where school matters were considered. The last day was spent at the Massachusetts General Hospital and Tufts Medical School.

State Health Insurance.—A hearing on state health insurance was held at the State House, Boston, recently, at which representatives of leading insurance companies appeared before the special Legislative Committee on Social Insurance. Mr. W. G. Curtis, president of the Insurance Economic Association of America, spoke in opposition to state insurance on the ground that such insurance is a tax on the people largely for the benefit of the improvident, and that the saving of "political waste" in Massachusetts would take care of the class of people that social insurance is designed to benefit. The representative of the Metropolitan Insurance Company expressed no objection to social insurance.

Harvard Medical School Open to Women.—The faculty of medicine of Harvard College has arranged that women may be admitted to the Medical School under the same requirements as men. The council of Radcliffe College will confer the degree of doctor of medicine upon such students as are recommended by the faculty of medicine of Harvard University. Applications for information about the registration of women should be addressed to the Dean of Harvard Medical School. Unless a reasonable number of competent students make application, the plan will be abandoned.

NEW ENGLAND NOTES.

New England Tuberculosis Conference.—The coming meeting of the New England Tuberculosis Conference to be held in Rutland, Vermont, on October 4 and 5, should be of peculiar interest as its program bears particularly on the special problems and responsibilities created by the war. The first day will state the problems, medical and social. The second day will suggest programs—national, state and local—for the solution of these problems. The following papers are scheduled:

Thursday morning, General Medical Session, Diagnosis of Tuberculosis in War Times: 1. the Use of the X-Ray, Dr. Horace J. Hawk, Mt. MacGregor, N. Y. 2. The Significance of Râles, Dr. Edward O. Otis, Boston. 3. The Value of Physical Signs, Dr. John B. Hawes, 2d, Boston. 4. What Constitutes a Diagnosis of Tuberculosis Sufficient for Rejection from the Army? Capt. Estes Nichols, U. S. A., Boston.

Thursday afternoon, Some Social and Statistical Aspects of Tuberculosis as a War Problem: 1. Some Facts and Figures in Reference to Tuberculosis as a War Problem, Louis I. Dublin, Ph.D., New York. 2. The Machinery Available and Needed for Handling Tuberculosis in the New England States, Dr. Arthur K. Stone, Boston.

Thursday evening, "Framingham Dinner," an opportunity to hear about the progress of the Community Health and Tuberculosis Demonstration at Framingham, Mass. Speakers, Dr. D. B. Armstrong and others. Public Mass Meeting, General Subject: Tuberculosis in a Nation at War. Addresses, Health Plays, Music and Motion Pictures.

Friday morning, War Programs, State and National: 1. A National War Program, Dr. Charles J. Hatfield, New York. 2. A State War Program, Dr. David R. Lyman, Wallingford, Conn.

Friday afternoon, 12.30 to 5.30, Roundtable Symposium: War Programs for Local Work, a series of five-minute talks, followed by general discussion. Each speaker will be limited to exactly five minutes, and others to three minutes.

The Massachusetts Medical Society.

Hampshire and Franklin Districts.—Dr. John T. Bottomley, Boston, addressed a joint meeting of the Hampshire and Franklin District Societies, at Northampton, September 13. The subject was The Control of Cancer. Dr. Bottomley is a member of the Committee on the Control of Cancer of the Massachusetts Medical Society. C. T. Cobb, *Secretary*.

NOTES TAKEN AT A PUBLIC HEARING BEFORE THE SPECIAL COMMISSION ON SOCIAL INSURANCE AT THE STATE HOUSE, SEPTEMBER 5, 1917.

CHAIRMAN: We have set aside this morning to hear from the labor interests of the Commonwealth with relation to the problem of social insurance which this commission is studying during the recess. This is really the first public hearing; at other meetings we have invited others in to give their views.

We have set various dates to hold hearings in the month of October. The hearing will probably be held in the city hall in the various cities where the commission will sit.

MR. HENRY STERLING, representing the State Branch of the American Federation of Labor: So far as I can recall, this subject came first before the state association at its annual convention in Springfield in September of last year. At that time a preamble and resolutions were adopted seeming to be favorable to the idea if a suitable measure could be devised. The matter was brought up again at a meeting in January of this year, and the resolution was amended by inserting the word "non-contributory," making it distinct that the state body desired that if any health insurance ever were passed, it should be a non-contributory insurance.

Numerous meetings were held by the legislative committee and the friends of the measure on the one side, and labor men more or less active on the other, and the more we conferred and the more bills suggested, the greater the difficulties seemed, until at last before the legislature came the bill which you are now studying. I think the most useful service I can render is to enumerate the various obstacles, difficulties and objections that we have seen.

The first difficulty is the question of compulsion. It is a different kind of compulsion from anything we have been used to in this country. The bulk of the laws are restrictive in their nature; a citizen shall not do this or that because if he did, it would work injury to his neighbor or the citizens as a whole. Not many order that a man shall do this or that; a few do: a man shall send his children to school, take proper care of his children, clean his sidewalks; these are positive mandates. But whether a law is restrictive or compulsory, back of it all the time is the theory that the thing is ordered for the good of the public, for the good of the Commonwealth, for the good of future generations, or to protect the general public or the neighbors. The particular kind of compulsion set forth in this particular bill introduces an idea entirely different, and the citizen is ordered to do a certain thing for his own good primarily; secondarily, possibly, for the good of his family. He is ordered to insure his health for his own protection, for his own welfare, for his own advancement, or for his own enrichment, or for whatever cause it may be. It orders a man, a grown citizen, to do this or that or the other just for his own good. I wonder if he shouldn't be ordered to take a cold bath every morning, as doctors frequently prescribe. I wonder, if you enter upon that line of legislation, just where you will stop. I don't see just where it would end with any reasonable logic .... That particular kind of compulsion to many of our people, both within and without the labor organizations, seems to be particularly obnoxious.

There is a second feature that makes it more obnoxious: You have a sharp line drawn; the poor man must insure and the man who gets better wages or a salary or can take care of himself, needn't insure. There is a distinct cleavage; it is class legislation that puts a compulsion upon the poor that it does not put upon the other people.

The third objection is along constitutional lines, —a matter of taxation. If you tax the employer a certain proportion and the employee the remainder, you have again the feature of class legislation; you have a tax levied upon specified classes and not on the rest, for a particular purpose, and it seems to me that taxation of that kind is entirely foreign to anything that has been done or considered or believed to be possible under our present constitution. The idea of taxing the poorest workmen on the assumption that they are not competent to look after the little money they do get, and the state will give it back when they are sick and may need it, may be a good proposition for those that are not considered competent to take care of themselves, but to an American citizen it doesn't appeal as being a desirable thing. Placing that tax upon the workman, collecting it through his employer, and turning it into the general fund would meet, I am sure, with most strong and strenuous objections. Putting it upon the employer would, I judge, meet with the same objections, and the additional objection that, while the workman was receiving something for his money, provided he was sick or disabled, the employer would never receive any direct return whatsoever for the tax levied upon him. So you would have the same thing that has been protested against frequently in the General Court: taking a man's money without any direct return. At the time of the passage of the Workmen's Compensation Act in 1911, on motion of Senator Tinkham, the whole act was referred to the Supreme Court of Massachusetts for its opinion as to its constitutionality, and the reply came back, distinct and clear, that if the act were a compulsory act it would be taking the money of the employer and giving it to somebody else without a direct return to the employer, which would be in effect confiscation. The opinion of the General Court was that the act was voluntary and not compulsory and that it was constitutional. Your health insurance would come under the same category. We all can make a splendid argument that there would be an indirect return through increased efficiency, etc., but the law and the courts insist upon a direct return unless taxes are taken for the general good.

Time and again the matter of giving gratuities has come up before the General Court, such as giving bounties to old soldiers, and the objection each time has been that you cannot give away public money to people except when they have given direct service for it or have performed some distinguished act in the service of the Commonwealth.

And lastly, and what to us perhaps seems the most important, I don't see how it is possible to establish any system of health insurance without instituting thorough, complete, and possibly frequent physical examinations of those who go to work. It has been considered for many years by our people that such examinations would work to the detriment of the man who was slightly injured or slightly ailing. Worse than that, it would give to an antagonistic employer who desired to blacklist a man who could do a full and proper day's work and discharge him, a legal ground behind which no one could go, thus adding to the many methods which are now in vogue of blacklisting and blackjacking those who make themselves offensive to certain classes of employers by standing primarily for the right, as they see the right, in behalf of themselves and their fellow workers.

I have set forth these objections which careful consideration, conferences and discussions have brought out in the minds of the laboring people in regard to health insurance. I conceive them to be insurmountable, and notwithstanding the glittering possibilities that seem to loom up with the proposition, notwithstanding that Germany with its autocracy has successfully carried on a system of some kind for many years, and notwithstanding that Great Britain adopted the system many years ago, many of us in the labor movement look upon the matter with suspicion, with doubt, with fears that more harm than good will come out of it, and with a desire that the matter shall be more thoroughly worked out than it ever has been yet before it is put upon the laboring people of this Commonwealth.

Oscar W. Clapp, representing the Brotherhood of Locomotive Engineers of the Boston and Albany R. R., Division 439; and secretary of a health insurance association which is not a brotherhood affair but takes in any engineer that is on that division: I have nothing to offer for or against the matter other than that it looks to me like a big proposition with a chance for a lot of fraud.

Our association pays $9 a week for 13 weeks after the first week, a $100 death benefit, and flowers for the member or his wife in case of death. The assessment is $1 a month. The by-laws are such now that it is almost impossible for a member to get anything unless it is absolutely square .... They take care of any member who is disabled, whether from accident or sickness. Have no physical examination. It would therefore be possible for a man who knew he was sick to join and get the benefits. They average one to three deaths a year. As the members grow older, new members come in. Most of the members get more than $25 a week and so would not be affected by the bill. The smallest pay is a few cents less than $25.

The association has not stated their sentiment regarding the bill. Mr. Clapp thought they would be opposed, quite naturally, if they were ordered to submit to an examination to see if they were qualified to hold their jobs.

Ignatius McNulty, representing the Boston Central Labor Union with over 116 affiliated locals of Greater Boston: The Boston Central Labor Union as a matter of principle believe in health insurance and have no objection to the employer carrying the burden, but they protest against the workingman or woman carrying it any longer. It is not of our choosing, nor is it because of any action of ours, that we are sick according to the law of averages; generally sickness comes to us because of our environment socially and industrially. We have borne it without, in a single instance, receiving a sympathetic voice from the employers' side. Those who are earning less than $25 a week or $100 a month suffer most from sickness. We have had an industrial act to take care of accidents, after a lot of howling from the employers as they did not want to take part of that load. According to the United States investigation, six and a half times more men are rendered unfit for work through sickness than by industrial accidents, and yet the same people argue against it. Health experts admit that there is no question that a great amount of sickness among workmen is due to their industrial environment, and we hold that the industry ought to bear the responsibility for sickness that they do for accidents.

Mr. McNulty emphasized the necessity of protecting women from puerperal fever, stating that the increase in mortality from this cause since 1893 was clearly shown by statistics. He also claimed that industrial environment was the cause of a high mortality among the children who survived the fever. "A child's life under six years of age is determined by his father's wages....."

What is causing the greatest number of deaths among adults from 25 to 45 years of age, the age when a man is most useful to his family and to the state? There are three great causes: tuberculosis, diseases of the heart or organs pertaining to the heart, and blood diseases. A man doesn't die suddenly from tuberculosis; he lasts from two to 36 months, maybe longer. Nor does he die suddenly from arteriosclerosis; he lingers for months or years, and often winds up in an insane asylum. Nor does a man die suddenly of heart disease, though you often hear they do. Tuberculosis is a germ disease and those who are susceptible are those who are ill fed, badly clothed, and badly housed, and work under poor conditions. They lie ill for months and have no protection; their wages are stopped, they are no longer on the payroll. If a brick falls on him he gets two-thirds of his wages, and we feel that if a man is sick by reason of his industrial and social environment he should be taken care of just as well.

Mr. McNulty objected to physical examination, considering it unfair when made by the employer's doctor, who might be prejudiced. His organization objects to contributory health insurance.

Rep. Frederic J. Brown: Do I understand that you are in favor of some form of health insurance if the employer pays for it?

Ans.: I don't know whether the employer will have to pay for it or not, but this I do know,—that we are not willing to pay for it, because we are already paying for it ourselves and the employer is not going to shove any additional tax on us when he is more responsible for the sickness than we are ourselves.

Rep. B. G. Collins: Why isn't the man who employs himself and receives $25 or less entitled to the benefits of such an act just as much as the man who works for wages?

Ans.: I think every one should be protected and that the bill exempts the most deserving people. I agree that all men and women ought to be protected whatever their salary is.

Rep. Fred P. Greenwood: You say that labor shouldn't bear any more of this burden: do you think it is fair that the employer should be assessed for the indisposition, for instance, of the forty or fifty thousand men who were arrested for drunkenness in this state last year?

Ans.: I don't think you have any ground for the statement that drink is the cause of disease. There isn't any data of any great value showing that drunkenness causes sickness. (This statement was questioned.)

Mr. McNulty concluded that the state should be the carrier.

Mr. Everett Morss: I have gotten a rather definite impression that Mr. Sterling seemed to think that health insurance wasn't much anyhow, and you think you ought to have it, but you agree on one point: that to the workman who gets this health insurance it isn't worth paying for.

Ans.: I object to my carrying the entire load and nobody giving me a word of sympathy. It is simply a refusal on the part of an intelligent working class to carry a load that it is not responsible for. We object to carrying it any longer as our load. If the state must take it up, all right.

Mr. William R. Grindod, Secretary of A. Fixers Union (1300 members) of New Bedford, and of the Amalgamated Textile .... (14,000–15,000): These two organizations are in favor of this social insurance. From my own observation right inside the textile mills, I know the people absolutely need this insurance.

Mr. Grindod emphasized the fact that women and girls were very frequently overcome at their work on account of the local conditions, which might be greatly improved if adequate inspection were instituted in the mills. He also felt that septic poisoning following an accident was chiefly due to the man's run-down condition. He felt his people would submit to a physical examination, but "it must be a proper medical examination."

Who shall bear the burden? I don't want to say the mill man should bear all the burden, but I think he ought to bear his share; and next, the state, because they benefit the most. I believe if the working people discovered they had to pay they would not be very much interested. Whether interested or not, we must have safeguards to protect the people, if necessary.

Rep. Fred P. Greenwood: Would the rank and file, the real people that we want to get at, come before our commission and tell the conditions under which they are working? Or would they be instructed? We can get at the employers and yourselves, but we want to get at the workmen themselves and find out what we have to do; we want to get at the conditions of the individuals themselves. Would they come?

Ans.: Yes, but you mustn't expect too much. The employers will attend those meetings, and our people know if they take the stand they will be either bribed or fired, and you can't expect our men and women to do that,

Mr. Greenwood: Then they are not at liberty to tell the conditions under which they work?

Ans.: They will come but they take an almighty chance when they do.

Mr. Greenwood: We want to hear from the people who are in it and have enough sand to tell under what conditions they are working; then we shall be in a position to reach the mill men.

Mr. Leo R. Donald, Treasurer of the Quillers and Beamers Union of New Bedford: We are in favor of non-contributory social insurance and do not think that the people who have borne the burden so long should be called upon to pay for any social or health insurance they get.

Mr. Donald stated that when a quiller reached 50 years of age, he was practically "all in"; that the length of a quiller's usefulness was from 12 to 15 years. He considered the sanitary conditions of the mills in New Bedford excellent, and that a man's home conditions depended upon the wages he received, though he admitted in discussion that the wages need not prevent the home being clean.

Mr. James H. Simpson, representative of the Carders Union of New Bedford (probably 100,000 such workers throughout the state):

Mr. Simpson felt that the carders should be protected by insurance as they work in a very dusty atmosphere, causing tuberculosis. The company's dust removers are inadequate. Without studying the question, he favored non-contributory insurance, but felt it should be compulsory on all employers. His people have no sickness benefit.

Rep. John J. Kearney, representing the Hotel and Restau. Int. Alliance and League of America:

Mr. Kearney felt very strongly that the state should take care of her citizens, stating that if the large corporations were allowed to base employment on physical examinations, there would still be thousands out of work.

Rep. Vincent Brogna: I would like to ask Mr. Kearney if he can give me some reason why a private employer ought not to have the privilege of examining the men he is going to hire, in the first instance; why should he not be allowed to hire a number one man and pay him accordingly?

Ans.: You have a perfect right to examine your employees as well as your products, but your employees are not to be examined as products. [Appeared to make a distinction between the rights of a man employing half a dozen men and one employing fifteen thousand. Felt the state should step in and discover why so many were rejected as not physically fit. Felt that the state should be responsible for such work as has been undertaken by the Life Extension Society formed five or six years ago, of which the principal organizer and active society is the Fred T. Ley Contracting Co.]

Mr. Collins: Do you believe that a sickness-preventive measure, as you might say, instead of health insurance, would accomplish the same end? Do you believe in compulsory physical examination if done by the state rather than by the employer?

Ans.: I believe the state should adopt a social insurance department. We didn't know how many were being injured until the state board took hold of it. There should be a general supervision by the commonwealth of all workers in the commonwealth, investigation of sickness, causes of disease, and care of the sick after they are unable to perform their work.

Mr. Joseph Bearak of the United Hebrew Trades (about 12,000) stated that his people were in favor of a non-contributory health insurance.

First, why social insurance? The answer is that we have found a large proportion of the industrial population of Massachusetts is getting weaker and weaker; more and more every year are taken out of the working class and thrown on the scrap-heap. If these cannot be cured, an old-age pension ought to take care of the man who has worked out his usefulness .... The worker today cannot, as an economic proposition, pay toward the health insurance because his earning power as compared with his earning capacity (?) today is less than it was ten years ago. Ten years ago probably he would have been in a good position to contribute to health insurance.

Second, if comes out of the worker because the worker is the greater proportion of the population. I don't think the employer ought to run it, but the commonwealth ought to take it.

Mr. Bearak objected to examinations before employment because of a tendency to discrimination. He felt that the man next on the union's list should be hired whether physically fit or not, and stated emphatically that if the prospective employer did not take that man, he would be unable to get any. If an employer refused to take a man known to be an agitator, the union could resort to a strike.

Mr. John F. Weld, representing the Massachusetts State Conference of Painters, stated that his 38 local unions did not believe in contributory insurance. The more fortunate members are already covered by insurance and do not feel that they can contribute to anything more at the present time.

Mr. Washburn: Your members are supporting more or less private benefit associations?

Ans.: Yes.

Mr. Washburn: Wouldn't they prefer to be compelled to go into a system of insurance whereby they would get a lower premium charge because of the fact that the state and the employer were compelled to come in with them?

Ans.: We are not supporting a private organization; we get all the benefits. We get $10 a week for 40 weeks, and a man can't go to work until the doctor says he is able to. Also have a death benefit of $250. Dues are $1.25 a month. [Mr. Weld felt this was more than they would get from the state. All members have access to the benefit association but it is optional. They have a large surplus and Mr. Weld did not feel that the expense would increase as the members grew older. They also have an unwritten law to help the family of a man over 50 years of age if they think he is in need.]

Mr. Harry J. Fitzpatrick of the Worcester Typographical Union stated they had gone on record as in favor of health insurance. He felt that in the study of the prevention of sickness it would be necessary to go back to childhood environment.

The Worcester Typographical Union has no sickness insurance, but a death benefit of $150. The Worcester Intern. Gr. M., with 75 members, pays $100 to $500 death benefit, for which the members pay one-half of one per cent. of their earnings a month. They also have an old-age pension for those who have been in the union 20 years; after the age of 60, if they wish, they can retire and receive $5 per week, for which they pay one-half of one per cent.

Mr. William F. Moore, representing the Taunton Central Labor Union, which includes 45 local unions in Taunton and the Attleboroughs, stated that they were in favor of non-contributory insurance. He felt that if the state took hold of the matter conditions in the mills would be improved. Referred especially to the dust in the jewelry mills, which is not adequately taken care of by the blowers. Lungs are affected after six years.

Mr. Arthur N. Harriman of the New Bedford Central Labor Union stated that they had "gone on record as in favor of some feature of the non-contributory scheme."

(The conference was to be continued in the afternoon.)

Miscellany.

EXEMPTION OF HOSPITAL INTERNES AND MEDICAL STUDENTS.

The following regulations governing the discharge of hospital internes and medical students from draft under the selective-draft law of May 18, 1917, have been made by the President:

"First. Hospital internes who are graduates of well-recognized medical schools or medical students in their fourth, third, or second year in any well-recognized medical school, who have not been called by a local board, may enlist in the Enlisted Reserve Corps provided for by section 55 of the national defense act under regulations to be issued by the Surgeon-General, and if they are thereafter called by a local board, they may be discharged on proper claim presented on the ground that they are in the military service of the United States.

"Second. A hospital interne who is a graduate of a well-recognized medical school or a medical student in his fourth, third, or second year in any well-recognized medical school, who has been called by a local board and physically examined and accepted and by or in behalf of whom no claim for exemption or discharge is pending, and who has not been ordered to military duty, may apply to the Surgeon-General of the Army to be ordered to report at once to a local board for military duty and thus be inducted into the military service of the United States, immediately thereupon to be discharged from the National Army for the purpose of enlisting in the Enlisted Reserve Corps of the Medical Department. With every such request must be inclosed a copy of the order of the local board calling him to report for physical examination (Form 103), affidavit evidence of the status of the applicant as a medical student or interne and an engagement to enlist in the Enlisted Reserve Corps of the Medical Department.

"Upon receipt of such application with the named inclosures, the Surgeon-General will forward the case to the Adjutant-General with his recommendations. Thereupon, the Adjutant-General may issue an order to such interne or medical student to report to his local board for military duty on a specified date, in person or by mail or telegraph, as seems most desirable. This order may issue regardless of the person's order of liability for military service. From and after the date so specified, such person shall be in the military service of the United States. He shall not be sent by the local board to a mobilization camp, but shall remain awaiting the orders of the Adjutant-General of the Army. The Adjutant-General may forthwith issue an order discharging such person from the military service for the convenience of the Government.

"Three official copies of the discharge order should be sent at once by the Adjutant-General to the local board. Upon receipt of these orders the local board should enter the name of the man discharged on Form 164A, and forward Form 164A, together with two of the certified copies of the order of discharge, to the mobilization camp to which it furnishes men. The authorities at the mobilization camp will make the necessary entries to complete Form 164A, and will thereupon give the local board credit on its net quota for one drafted man."

1. It will be observed that paragraph *First* of the foregoing deals with internes and students who shall *not* have been called by a local board, and provides that they may enlist in the Medical Enlisted Reserve Corps under regulations to be issued by the Surgeon-General, such enlistment entitling them to discharge from draft if thereafter called.

2. An application for enlistment under this paragraph must be forwarded to the Surgeon-General with the affidavit of the applicant, supported by the certificates of his school authorities, showing his present status as interne or student, and particularly how long he has been an interne in the one case, or the year of the medical course that he is pursuing in the other.

3. An interne who has served one year or more as such, will not be enlisted in the Medical Enlisted Reserve Corps under this regulation.

4. An interne who is enlisted in the Medical Enlisted Reserve Corps hereunder will be called into active service under his enlistment, if his services are needed, at the end of one year of interneship. Applications for commission in the Medical Reserve Corps, from internes who at the expiration of one year's interneship are called for duty as members of the Medical Enlisted Reserve Corps, or from internes whose year of interneship is about to expire, will receive proper consideration.

5. A medical student (undergraduate), who is enlisted in the Medical Enlisted Reserve Corps hereunder will be called into active service under his enlistment, if his services are needed, upon failing to pass from one class to another, or upon failing to graduate.

6. The *Second* paragraph above quoted deals with internes and students who *shall have been* called for service by a local board under the selective-draft law, and contemplates their discharge from the draft, upon condition that they shall enlist in the Medical Enlisted Reserve Corps.

7. It will be the policy of the Surgeon-General as a rule to recommend discharge from the draft upon the condition indicated, the discharge to be followed by a call to active duty under the enlistment in the Medical Enlisted Reserve Corps at the expiration of a complete year of interneship or upon the failure of the student (undergraduate) to pass to the next higher class or to graduate.

8. Internes and students who are enlisted in the Medical Enlisted Reserve Corps by virtue of these regulations, and are not called into active service under such enlistments, are required to report their status to the Surgeon-General as follows: Internes, at the end of each three months' period, such report to show the total amount of interneship since graduation, and to be countersigned and attested by the Medical Superintendent of the hospital; students, at the end of each semester, such reports to show whether the students qualified for advancement, and to be countersigned by the deans of their respective schools or by subordinate officers representing the deans.

9. In the execution of these regulations, the Department will not recognize interneships in hospitals, sanatoria, or other institutions conducted for profit, or in small private hospitals (50 beds or less), or new interneships established or added since May 18, 1917, to those previously existing, at any hospital, excepting such as may have been newly established and added by reason of a proportional increase in the bed capacity of such hospital; nor will it recognize interneships in the case of any graduate appointed thereto later than August 1, following his graduation.

By order of the Surgeon-General:

ROBERT E. NOBLE,
Lt. Colonel, Medical Corps.

Correspondence.

DIRECT MEDICATION.

New York, Sept. 17, 1917.

Mr. Editor:—

As a very practical and useful addition to your editorial on direct medication, I suggest the use of hypodermic tablets under the tongue. I have found morphine and atropine, employed in this way, most satisfactory. They are rapidly absorbed, avoid the necessity of using the hypodermic syringe, and are available immediately, by any physician at any time. Indeed, I am now convinced that thus employed the hypodermic tablets have a very wide and beneficent field of usefulness, in both civil and military practice. They should be carried and utilized in case of urgent need by every practitioner. I do not claim originality for my suggestion, as it was referred to by a physician not long since in one of the medical journals, but where precisely, I have forgotten.

I propose to use tincture of strophanthus in this way. I have already done so with much satisfaction by making use of the ordinary Fraser tablet, in an emergency. The almost immediate result was remarkable and satisfactory.

There is no need to swallow water, as the saliva is quite sufficient to dissolve the tablet and without any risk, even to an unconscious patient. No doubt strychnine, digitaline and other alkaloids could be advantageously used when administered under the tongue, and hypodermic use not available and not even desirable. Swallowing these alkaloids and absorption through the stomachal mucous membrane are relatively slow and otherwise occasionally objectionable or impossible.

Beverley Robinson, M.D.

RADIUM AND MALIGNANT DISEASE.

Boston, September 18, 1917.

Mr. Editor:—

Apropos of the recent report of the Collis P. Huntington Hospital, published in the Journal, one wonders, and is apt to be led into a state of doubt and uncertainty as to the real value of radium in the treatment of malignant disease, since, on the whole, this report differs so widely from the stated results of others who are working along the same lines. As an illustration of this, one has but to read the report of Barringer (*Jour. A. M. A.*, April 28, 1917. Abstracted by E. H. R. in this journal, Sept. 6, 1917) and another by Holding (*Ann. of Surgery*, June, 1917, same abstractor), particularly the former, who gives an almost glowing account of his work in the treatment of carcinoma of the bladder and prostate. Compare his results with those following treatment of the same structures by the Huntington Hospital officials. Those of us who were present at the address by Dr. Howard Kelley at the Medical Building, less than a year ago, will clearly recall this gentleman's description of the wonderful successes at the hands of himself and his associates in practically all types of malignant disease. Given a fair field for trial, a sufficient amount of radium element, the requisite skill, judgment, experience and knowledge of technique, it is hard for the rank and file of us medical men to understand, and discouraging as well, why there should be so wide a variation in the results of the work in question—a work of the deepest interest and greatest importance to all the world.

James Brown Thornton, M.D.

SOCIETY NOTICE.

Essex North District Medical Society.—A quarterly meeting of the Essex North District Medical Society was held at the Danvers State Hospital, Hathorne Station, Wednesday, Sept. 26, 1917, upon invitation of Dr. Macdonald Superintendent.

Papers were presented as follows:

"Methods of Procedure in Commitment of Patients to this State Hospital," by Dr. W. A. Bryan.

"Early Signs and Symptoms of Insanity," by Dr. N. G. Prueman.

"Social Service Work. Its value to the Physicians and the Community," by Miss Hannah Curtis.

The next meeting of the Censors will be held at Hotel Bartlett, Haverhill, Thursday, Nov. 8, 1917, at 2 P.M. sharp. Candidates for admission to the Society should bring their diploma.

J. Forrest Burnham, M.D., *Secretary.*
T. R. Healy, M.D., *President.*

UNITED STATES CIVIL SERVICE EXAMINATIONS.

SCIENTIFIC ASSISTANT IN PUBLIC HEALTH WORK. (MALE).

The United States Civil Service Commission announces an open competitive examination for scientific assistant in public health work, for men only. Vacancies in the Public Health Service, in Grade 1 positions at salaries ranging from $1,500 to $2,000 a year, and in Grade 2 positions at salaries ranging from $900 to $1,500 a year, and in positions requiring similar qualifications, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Certification for filling the higher-salaried positions in either grade will be made from those attaining the highest average percentages in such grade.

The duties of appointees in the first grade will be to assist in making epidemiologic and sanitary surveys to determine the prevalence and causation of disease, to conduct laboratory studies in relation thereto, and to recommend measures to prevent and control outbreaks of disease; and in the second grade, similar duties subject to instruction and direct supervision. The duties in either grade require knowledge of local conditions, particularly of the people of the locality, and ability to meet and deal with these people in such manner as to accomplish the results sought.

Collegiate or university instruction in medicine or biology or sanitary engineering, subsequent to graduation from a four-years' high school course, and at least six months' experience in public health work, under Federal or State authorities, are prerequisites for consideration for Grade 1; and at least graduation from a four-years' high school course and six months' experience in public health work under Federal or State authorities, are prerequisites for consideration for Grade 2.

Statements as to education and experience are accepted subject to verification. Statements as to adaptability for public health work will be obtained by the Commission from the Federal or State health authorities under whom the applicant has served.

If a thesis is submitted under the third subject of Grade 1, it must be on some sanitary subject upon which the applicant has done some special work. The thesis or publications must be accompanied by a statement under oath, taken before an officer authorized to administer oaths for general purposes, in the following language: "I, the undersigned, do solemnly swear (or affirm) that in the preparation of the accompanying material the composition is entirely my own, and that I have given full credit by quotation marks or references to authorities for any quoted matter." The applicant's name and address should be written on the material.

Appointees must be of good character and physique.

Applicants must submit with their applications their photographs taken within two years. Tintypes or proofs will not be accepted.

Applicants must have reached their twenty-first but not their thirty-fifth birthday on the date of the examination.

This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Post Office, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Cal; Customhouse, New York, N. Y., New Orleans, La., Honolulu, Hawaii; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed, including the medical certificate but excluding the county officer's certificate, and must be filed with the Commission at Washington, with the material required of applicants under Grade 1, prior to the hour of closing business on October 2, 1917.

PATHOLOGIST (MALE).

The United States Civil Service Commission announces an open competitive examination for pathologist, for men only, on October 3, 1917, at various points throughout the United States as designated by the Commission. A vacancy in Freedmen's Hospital, Washington, D. C., at $2,000 a year, and future vacancies requiring similar qualifications, at this or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Applicants must show that they have had at least one year's experience in a pathological laboratory after graduating from a medical college of recognized standing, and that they are able to make all kinds of pathologic examinations and reports thereon.

Statements as to training and experience are accepted subject to verification.

Applicants must have reached their twentieth birthday on the date of examination.

Applicants may be examined at any place at which this examination is held, regardless of their place of residence, and become eligible for appointment to Freedmen's Hospital and other branches of the nonapportioned service; but those desiring to become eligible for appointment in the apportioned service in Washington, D. C., must be examined in the State or Territory in which they reside and have been actually domiciled in such State or Territory for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D.C. Applications should be properly executed excluding the medical certificate, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination as given at the head of this announcement should be stated in the application form.

PHYSICIAN (MALE).

The United States Civil Service Commission announces an open competitive examination for physician, for men only. Present and future vacancies in the position of physician in the Indian and Panama Canal services, acting assistant surgeon in the Public Health Service, surgeon in the Coast and Geodetic Survey, and in positions requiring similar qualifications in other branches of the service, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Entrance salaries in the Indian Service range from $1,000 to $1,200 a year; in the Panama Canal Service, $1,800 a year; in the Public Health Service, from $180 for part time to $1,800 a year for whole time; Coast and Geodetic Survey, $1,020 a year, and an allowance for subsistence at $1 *per diem* while serving on board ship, except in the Philippines, where the allowance for subsistence is $2.50 *per diem*.

Certification for filling vacancies in the Public Health Service will be made of the highest eligibles residing in the vicinity of the place at which the appointee is to be employed, except that upon the request of the Department certification will be made of the highest eligibles on the register for the entire country who have expressed willingness to accept appointment where the vacancy exists.

The applicant must have graduated from a medical school of recognized standing or be a senior student in such an institution and furnish proof of actual graduation within six months from the date of the examination. Additional credit will be given to competitors for physician positions in the Tropics, who have had special training in tropical medicine. Only persons who have had at least two years' experience in the practice of their profession since graduation will be eligible for appointment to the position of acting assistant surgeon in the Public Health Service.

The number of surgeons in the Coast and Geodetic Survey actually employed and under pay at any time is eight. Three of these are employed in Alaska and on the Pacific coast, four in the Philippines, and one on the Atlantic coast and in Porto Rico. Officers serving in the Philippines are usually relieved at the end of two years. All surgeons are attached to vessels; and while their first duty is to conserve the health of the crew, it is expected that they will take part in the work of the survey. Appointments will be confined to those who indicate willingness to accept service in any of the regions named.

Applicants must have reached their twenty-first birthday on the date of making oath to the application, but eligibles who were more than 40 years of age on the day of making oath to the application will not be certified except for filling vacancies in the position of acting assistant surgeon in the Public Health Service, and eligibles who were less than 22 or more than 30 years of age on the day of making oath to the application will not be certified for positions in the Panama Canal Service.

For positions in the Public Health Service and in the Coast and Geodetic Survey the medical certificates in the application form must be executed by an officer of the Public Health Service, except that when this requirement would work a hardship upon an applicant because of his distance from such officer, he may have the certificate executed by any physician. In this event, however, he may be required to pass a physical examination before an officer of the Public Health Service before appointment.

Statements as to training and experience are accepted subject to verification.

Until further notice and on account of the urgent needs of the service, applications will be received at any time. Papers will be rated promptly and certification made as the needs of the service require.

These examinations are open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Post Office, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Cal ; Customhouse, New York, N. Y., New Orleans, La., Honolulu, Hawaii; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R. Applications should be properly executed, including the medical certificate but excluding the county officer's certificate, and must be filed with the Commission at Washington, with the material required of applicants under Grade 1, prior to the hour of closing business on October 2, 1917.

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THE TREATMENT OF GASTRIC HYPERACIDITY AND HYPERSECRETION.

By William F. Boos, M.D., Boston.

Hyperchlorhydria gastrica, or gastric hyperacidity, is very often seen in practice. As a primary condition it is apt to follow the excessive use of tobacco and the drinking of too many cocktails or highballs or sweet, soft drinks; it is also induced by overeating, the bolting of food and errors in diet. These causes are all sufficiently obvious not to need comment, except, perhaps, the last one; this, I think, deserves special consideration because it is remarkable how errors in diet, which in themselves are not flagrant, often cause gastric disturbances in many people who are otherwise well, and who are moderate in their habits, but whom experience has taught to avoid certain food articles which invariably cause trouble. The "forbidden" foods usually include the things commonly accepted as being difficultly digestible, such as fresh bread, griddle cakes, baked beans, mackerel, bluefish, roast or boiled pork, steamed puddings, sweets and fatty, fried or acid foods; but at times fairly innocuous substances distress susceptible persons, and it is not surprising if they imagine their digestive difficulties to be due to some gastric disorder for which they consult a physician. Patients of this kind are quite common; they belong, as a rule, to the professional classes, with mental rather than physical occupations, and their intolerance is due largely to their mode of life, which does not provide a sufficient amount of exercise and relaxation to encourage normal digestion. Besides this, some of the other causes mentioned may, of course, be doing their part to produce the patient's hyperacidity. In the study of each case careful questioning will usually reveal the source of trouble, and this, if possible, must be removed.

The causes of hyperacidity which I have mentioned above are, so to speak, external, and all the patients really require is a sensible regimen. They should be told, above all, that their intolerance is functional, and not the result of disease, that it is simply a warning of improper living; and they must be taught how, when and what to eat, when and how to exercise, when and how to rest and play. The use of tobacco or alcohol should be either prohibited or else greatly restricted. If the food intolerance becomes very pronounced, medical treatment is necessary.

In another and a very important class of cases the hyperacidity is merely a part-picture of a general neurosis. The cases of this character are decidedly on the increase, particularly here in America, where the restless striving and the keen competition of business and professional life are making ever greater and greater demands on the nervous reserve of the individual. The gastric symptoms of these cases are the expression of a disturbance in the enervation of the gastric glands, which usually takes the form of a hyperstimulation. As a result of excessive stimulation the gastric glands are caused either to secrete pepsin-hydrochloric acid in considerably greater quantities than is necessary for gastric digestion, or there is produced a flow of gastric juice for longer periods of time than is normally desirable. The latter condition constitutes what is known as hypersecretion, and patients who are afflicted with it show, at times, an almost continuous flow of gastric juice, the acidity of which may or may not be above the normal. In many cases, however, hypersecretion and hyperacidity go hand in hand.

A third moment which frequently complicates gastric neuroses is an increase of gastric motility, which causes the stomach to be emptied several hours before the norm. A typical case of hypermotility in which the other two conditions are also present is shown in the accompanying x-ray plates. The patient's history follows:

Case 1. W. S. Y., male, 44, married, lawyer. For several years the patient has had gastric symptoms, which are getting worse. He now has heartburn, a sensation of fullness in the epigastrium and eructations of gas occurring about forty minutes after meals and lasting $\frac{3}{4}$ of an hour to 1 hour. The same train of symptoms reappears 3 to $3\frac{1}{2}$ hours p.c., this time with acute pain in the epigastrium. Without medicine his symptoms usually last till the next meal. Bicarbonate of soda gives relief for a short time only, therefore the patient has to take it repeatedly. The gastric pain often keeps him from sleeping at night, and he is apt to awake in the morning with headache and often with nausea. On physical examination, the lower border of the stomach was found to be three fingers' breadth above the umbilicus. There was no tenderness. The test breakfast was recovered 45 minutes p.c. The quantity was 25 cc.; the total acidity, 102% = .372 HCl. The capacity of the stomach was 900 cc. The x-ray after a bismuth meal shows high, small stomach, the emptying of which is immediate and rapid; the stomach is quite empty at the end of three hours. Plates of the average normal stomach, for control, show food present in the stomach at the end of six hours.

Depending on the character of the meal, the symptoms of hyperacidity appear in from 30 minutes to two hours after the ingestion of the meal. If the latter consisted chiefly of carbohydrates the symptoms come early while the ingestion of meat and fats retards their appearance. Heartburn, a feeling of fullness and of pressure in the epigastrium, eructations of gas, nausea, and distress, with or without pain, are very common. Some patients also feel "light-headed" or dizzy, others, again, complain of headache. Children with hyperacidity are very apt to have cankers in the mouth. As a rule the patients have trouble with the bowels, which are apt at one time to be too constipated and at another too loose.

An Ewald test breakfast will usually show increased acidity. If the test breakfast proves negative, it is well to give a test meal of one pint of milk and two rolls (Klemperer). This meal, which is recovered two hours later, shows definitely whether or not there is increased acidity. In giving the Ewald breakfast the possibility of hypermotility should be borne in mind, it being my experience that in the average case of this kind the stomach empties itself in 75 minutes. For this reason I generally recover the test breakfast in 45 to 50 minutes instead of waiting an hour, as the textbooks advise.

In cases of hyperacidity the test meal shows good digestion, its acidity is increased, but there are no pathological elements present. The patient's stomach is usually normal in size, occasionally it is smaller than normal (x-ray case). Examination of the urine shows diminished chlorides.

The only abnormality to be found in the test meal, therefore, is the increased acidity, and even this is not apparent in every case with typical symptoms of hyperacidity.

If the patient is also subject to hypersecretion, his symptoms last much longer after the meal; they may, in fact, continue until food is again taken, when they subside temporarily. The symptoms also appear quite independently of meals; thus the patient may awake in the morning with a headache followed by gastric distress, nausea and the vomiting of considerable quantities of a clear fluid, which is so acid that it causes furring of the teeth. This train of symptoms may reappear at any time during the day when the stomach is empty or nearly so. If there is much retching, the vomitus finally contains bile. After vomiting, the patients feel much better, and this is usually the reason why they learn to induce vomiting, rather than to suffer their tortures for an hour or more.

In the presence of sufficient symptoms it is not difficult to make a diagnosis of hyperacidity or hypersecretion, but when the patient appears not to have any digestive disturbance in the ordinary sense, the source of his trouble is not so apparent. In these cases without direct gastric symptoms I find that certain reflexes are helpful in making the diagnosis; headache in the morning, dizziness an hour or two after eating or when the stomach is empty, and frequent pain in the back, are the more common of the gastric reflexes, and when the patient shows one of these, or all three, the possibility of hyperacidity or hypersecretion, or both, should suggest itself. The following cases are of this type:

Case 2. C. L. H., female, 35, married 15 years, 3 children. Menses regular, digestion, according to patient, normal. No pyrosis or gastric distress, no vomiting, bowels fair. Patient complains of attacks of dizziness with, at times, syncope. Has fainted repeatedly in street, and once in subway station. Fainting spells occur a long time after eating. Patient has frequent "nervous headaches," particularly when she wakes in the morning. She has been told by a physician that she probably has heart trouble or hardening of the arteries. She has no palpitation or dyspnea on exertion. Physical examination negative. Blood pressure: syst., 130; diast., 92. Urine negative. Test breakfast recovered 50 minutes p.c. represents a colorless, slightly opalescent liquid with finely divided bread. Quantity, 55 cc. No pathological constituents; acidity 87.2%, corresponding to 0.318% HCl.

CASE 3. W. J. C., female, 25, married 4 years, 2 children. After the second baby came, the patient had bad dizzy spell; since then she is dizzy much of the time, and she also complains of numb feeling in the hands; she feels very dizzy when she stoops. The bowels tend to looseness. There is no nausea, vomiting, heartburn, gastric distress or gas. Test breakfast: total acidity 91.5%, or 0.3342% HCl.

CASE 4. E. T. C., male, 29, single, salesman. Headaches for several months, dizziness much of the time; occasionally the dizziness is so bad that he falls in the store. No nausea, gas, heartburn, or other gastric symptoms, except a feeling of faintness in the epigastrium at 10 a.m., when the dizziness is also worst. Test breakfast shows total acidity 96%, or 0.351% HCl.

CASE 5. L. F. A., male, 59, single, lawyer. For one year strong tendency to headaches, usually aggravated by alcohol. Bowels loose with slight indiscretions in diet. Headaches in middle of morning and about 4-5 p.m. No vomiting, nausea, or gastric distress. Patient very nervous. Test breakfast shows total acidity 79.2%, or .288% HCl.

CASE 6. I. M. D., female, 38, single, bookkeeper. For some months "trembly" sensation in the epigastrium and pain in the back at 10-11 a.m. Her back feels as if it were scraped with some sharp instrument. No heartburn, etc. Total acidity 86.5%, or 0.315% HCl.

CASE 7. B. E., female, 11, school. Patient has had cankers for years, but of late they have been almost constantly present. She also suffers from frequent headaches, and very often when she is at school she feels a pain in the middle of the back. This pain appears at about 10 a.m. The child is attending a school where hard study is required. The physical examination showed several aphthae in the mouth, otherwise it was negative, except that the child is rather thin. I did not pass the tube in this case.

Normal gastric acidity ranges between .12% and .2%. All the patients who had the test breakfast, therefore, showed marked hyperacidity. The cases I have enumerated, including the canker case, were treated for hyperacidity and hypersecretion in the manner to be described later, and in all of them the symptoms disappeared entirely.

The study of gastric neuroses shows that the symptoms referable to hyperacidity and hypersecretion are progressive. Appearing at first once or twice a week only, they gradually become more and more frequent, until in time every meal is followed by its distressing sequelae, and the gastric symptoms finally dominate the picture to such an extent that they create the impression of a primary gastritis.

At this juncture the stomach trouble becomes an important cause of the patient's neurosis. We have here, as it were, a vicious circle: At first there is a general neurasthenic condition, in which gastric symptoms gradually appear as the result of a neurogenic disturbance of gastric secretion. As these symptoms become more and more pronounced, they react upon the patient to make him more nervous, that is to say, to produce a neurosis of greater degree; the latter, then, in turn, increases the disturbance in gastric secretion.

It is obvious, I think, that the first step in the treatment of such cases is to remove, as far as possible, the symptom-complex arising from the stomach, thus eliminating what has become one of the causes, if not the chief cause, of the continued neurosis. When once the gastric symptoms have ceased to irritate the patient, the general nuerosis will be amenable to rational therapy, such as suggestion, careful régime, rest, exercise, bromides, etc.

The dietary directions for hyperacidity and hypersecretion are the same whether the cause is external or neurogenic. The patient's food should be carefully indicated by a list. In order that his stomach is never quite empty, he should have five or six meals a day, instead of three. He must take sufficient time to eat his meals, and he should rest after each main meal. On account of the possibility of hypermotility, the food should contain plenty of butter, which retards the emptying of the stomach. To reduce the supply of hydrochloric acid forming material, his diet should be made as nearly salt-free as possible. Sweets stimulate the flow of HCl, therefore they should be prohibited. As regards the diet list, I find that my results are more satisfactory if I enumerate the things the patient may or may not have at each meal, rather than to indicate in a general way what he may eat and what he must avoid. The following is a sample.

DIETARY REGIMEN.

BREAKFAST (7.30 a.m.): Baked apple with cream; eggs, boiled, poached, on toast, shirred or scrambled; grilled bacon; steak or chop; Bensdorp's cocoa; occasionally one cup of coffee with much milk; buttered toast or crisp rolls.

10 a.m.: A glass of good, rich milk with bread and butter or zwieback.

LUNCHEON, 1 p.m.: Boiled rice or farina with cream or milk; a cup of custard or milk toast; crackers with milk; green vegetables with mashed or baked potatoes; macaroni cooked with cheese; spaghetti; broiled, creamed, baked or boiled fish (no mackerel, salmon or bluefish); occasionally cold meats; potatoes baked in their jackets with parmesan cheese; fish chowder; oyster stew. With any of these luncheon dishes, bread and butter or buttered toast. Daily, baked apple with cream, stewed prunes or apricots, apple sauce.

4 p.m. A glass of good, rich milk with bread and butter or zwieback.

DINNER, 6.30 p.m.: Oysters on the half shell, from November 1 to March 31, only; no clear soups, but cream and thick soups; chowders (except clam chowder). Fish: As at luncheon. Meat: Fowl, game, veal, beef (rare), steak (rare), lamb, very mild ham. The meats should be prepared in simple style, without fancy sauces and without spices. They should be roasted, broiled, stewed, pot roasted. Tender boiled beef and fowl are allowable. Vegetables: Young carrots, peas, beans, cauliflower, mashed turnip, asparagus tips, squash, summer squash, spinach in French style, lettuce, cooked like the spinach (very delicate), egg plant (not fried), oyster plant (not fried). Vegetables should be cooked with plenty of butter. When fresh vegetables are not available, the good brands of canned vegetables form a perfect substitute. Potatoes: Baked, boiled, au gratin, mashed, creamed, Delmonico. Macaroni, rice, spaghetti, noodles. Green salads with plenty of oil and little vinegar. Weak tea. Soft crackers and a little mild cheese. Puddings are allowed, except plum, suet, steamed or any other heavy puddings. Fruit and wine jellies are allowed; also ice cream, but you must eat this very slowly, melting it in the mouth. No pies, pastry or fritters.

9 p.m.: A glass of good, rich milk.

In General: No raw or fried onions, no radishes, garlic, horse radish, ketchup, chutney, Worcestershire sauce, pickles, curry, olives, mustard. Avoid hot or fresh bread. Do not eat fried or salty food, but use just enough salt in your food to make it palatable, no more. Little or no sugar in your food. No candy. Rest for a half hour or longer after each main meal of the day, lying on your right side. Take regular exercise, such as walking, swimming, doubles in tennis, golf, horseback riding, bowling (in winter).

Eat slowly. Chew your food well. Go to bed early. Do not read novels at night. Stop worrying. Keep your bowels regular. Take a tepid sponge bath in the morning.

Milk is given between the meals, because the proteids in it absorb much pepsin-hydrochloric acid, while the butter fat delays emptying of the stomach. The use of some alkaline water at meals or immediately after is advisable in all cases, and French Vichy is good for this purpose. A glass of Vichy or simply of hot water on an empty stomach also helps to relieve the morning distress of hypersecretion by diluting the acid contents of the stomach.

This dietary regimen is suitable also for cases of gastric ulcer with hyperacidity, but ulcer patients must be warned to avoid, in addition, foods leaving a coarse residue, such as cabbage and most greens, as also raw fruit like apples, pears, pineapple, etc., and nuts and raisins.

As I have stated, many cases of hyperacidity, due merely to external causes, will gradually yield to the regimen alone, but improvement is, of course, more rapid if the patient receives medicines from the start. Hyperacidity of neurogenic origin always requires medicines.

In the medicinal treatment of hyperacidity, preparations containing proteolytic ferments, such as pepsin, papain, and pancreatin, have been much in vogue. The use of these ferments is, to my mind, however, quite irrational, since in cases of this kind the pepsin is already present in abnormal amount. The gastric juice of the patient with hyperacidity contains not simply excessive hydrochloric acid, but excessive pepsin hydrochloric acid; in other words, the pepsin is increased in the same measure as the hydrochloric acid, with the result that digestion is really more vigorous than in the normal individual. What these patients need is neutralization of the acid, with consequent relief from its irritant action on the gastric mucous membrane. Bicarbonate of soda gives this relief very promptly, but its neutralizing effect does not last long, since this salt, being soluble, is carried out of the stomach by peristalsis before the excessive acid formation has ceased. In order to obtain more lasting neutralization, it is necessary to use insoluble compounds, such as the carbonates of magnesia and lime, and the oxides of magnesium. These substances are precipitated among the rugae of the gastric mucous membrane, where they remain to neutralize the hydrochloric acid as it is formed. They are removed from the stomach only as they are converted into their soluble chlorides. I find that in nervous hyperacidity with a tendency to loose bowels carbonate of lime develops a threefold action: it neutralizes the excess of acid, it stops the looseness of the bowels, and the absorption into the system of the calcium chloride which is formed in the stomach produces a distinct quieting effect on the patient's nervous condition.

In practice I have used for years a mixture of calcium carbonate and magnesium carbonate or oxide in form of a powder, the quantity of each depending on the state of the patient's bowels. This powder answers the purpose very well, but occasionally patients complain of the inconvenience of taking powders, particularly when they are away from home. With these patients I have recently used a preparation in tablet form which is said to contain similar compounds of the alkaline earths, and which was submitted to me for trial. I found that the tablets, which are known under the name of Pyrosan, act much the same as the powders. They also have a slight cathartic action when they are taken in quantity sufficient to relieve the gastric symptoms.

For hyperacidity, I have the patients take one powder t.i.d. from 30-50 minutes p.c. If their symptoms occur earlier, *i.e.*, while they are still eating, or immediately after eating, I have them take a little bicarbonate of soda just before the meal. For the morning headache of hypersecretion I advise them to take another powder when they go to bed. In the following case I tried the tablets instead of the powder.

Case 8. T. W. S., male, 51, single, engineer. The patient has been subject to headaches for many years, but they have been more frequent and more severe for the last six years, following his father's death. The patient now wakes at 5 A.M. with severe frontal headache. Sometimes the headache is unilateral, often it is so severe that the eyes ache and seem to bulge from the sockets; at times there is nausea with the headache. The bowels are very constipated, the appetite is fair. Tobacco, very little; alcohol, none. He has never been exposed to venereal infection. For years he has taken three to four powders of phenacetine and salol daily for his headaches. The patient is very thin, otherwise physical examination is negative, except that the blood pressure is 182. The urine is negative.

Since the patient was obliged to leave the city for an extended trip on the same day, it was not possible for me to give him a test meal. From his symptoms I felt, however, that his morning headaches might be due to hypersecretion, and I therefore advised him to take two tablets three times a day after eating and two at bedtime, that is to say, eight tablets in all. On his return from the trip he told me that on the morning after he took two tablets at night he was free from headache for the first time in years. He is now taking the tablets as indicated, he does not have any headaches and his bowels move twice a day.

In view of the fact that cases of hyperacidity and hypersecretion without definite gastric symptoms, like the last case, are quite common, it is well to make the treatment of nervous patients such that these two conditions are provided for. This does away with the giving and analyzing of test meals, a practice which the busy doctor rarely has time to carry out.

By using the measures I have indicated, the stomach condition may be cured or greatly relieved. But relief from gastric distress is merely the first step in the treatment of neurogenic cases; the physician should go further, he should try to ascertain and to remove the original cause of the trouble. To do this he must analyze the underlying neurosis so that all the disturbing factors may be brought to light and dealt with separately; he should not follow the common practice, simply to prescribe bromides, and allow the patient to drift along with all the causes of his nervous collapse still active, when a little real interest may keep him from becoming a hopeless neurasthenic. In many cases, particularly where family and financial troubles are concerned, there is, of course, little to be done beyond giving the patient mental and moral encouragement and support; occasionally, however, we see a case like the following:

Case 9. J. P. P., male, 22, single, salesman. For one year distress after meals, becoming more and more pronounced; ½ to ¾ of an hour p.c. he has heartburn, eructations of gas, pressure and acute pain in the epigastrium, lasting one hour or more and returning several hours later. There is no vomiting. The patient is apt to awake with headache in the morning, and often his headache continues during the day. The epigastric pain is so intense that the family doctor made a diagnosis of peptic ulcer and advised operation. There has been no vomiting of blood and no tarry stool. There is no tenderness. Repeated examination of stool for occult blood, negative. X-ray, negative. Although the patient's pain was suggestive of Moynihan's hunger pain, I could not find any positive evidence of ulcer. I decided, however, not to pass the tube on account of the danger of ulcer, and I treated him as a case of hyperacidity with hypersecretion, also giving him bromides in considerable amount for his greatly increased nervous reflexes. While he was under the influence of bromides he got along fairly well, but as soon as he tried to do without them or even appreciably to diminish the dosage, his nerve control again collapsed.

Inquiry into the condition of his employment gave me the following story: He was working for a large corporation, with whom he had been five years. Being ambitious, he worked hard and stayed overtime at the office nearly every day; during the last few years, however, one man after another, with apparently less ability, but with more influence than he had, was raised above him. Despite his disappointment, he worked harder than ever and, as is usual in such cases, he was exploited by his office chief who did nothing to improve his position.

In view of these facts, I told him that a change of occupation was about the only thing that would save him from becoming a nervous wreck. He was afraid to begin all over again, as he put it, but in the end he took my advice and sought a new position. This time he found employment with people who showed substantial appreciation of his ability and application. He has now been in his new place for about a year, and when I last saw him he was doing entirely without medicine and was free from all symptoms. I give this case in detail because it is typical of many.

In conclusion, I wish to say a few words about the importance of good reading as a therapeutic measure in nervous cases. Patients of this kind are, as a rule, constantly "on the go," seeking diversion in the company of friends, at the club, in the theatre and at the moving pictures; they seem, in other words, to be entirely dependent on outward stimuli for their entertainment and distraction. On inquiry one usually finds that outside of the daily papers, they read, at best, only the current novels. What these people need is more relaxation and better mental balance, and I think there is nothing like a good book to give them both; good reading brings out the resources within them and it develops mental stability and independence.

The best books for our purpose are biographies, autobiographies, and the memoirs of well-known men and women, also books of poetry, books of travel and exploration, historical novels, like those of Mühlbach and Ebers, and the plays of Molière, Shaw, Dunsany and others.

I give my nervous patients a list of books which I require them to read in sequence, and in order to make sure that they actually do their reading I ask them to tell me what they think of each book. In many instances the patients become good readers and the resulting effect on their nerve control is very gratifying. If they are unwilling or too impatient to make a beginning, it is a good plan to try reading aloud to them. This will often rouse their interest to such an extent that they continue to read on their own account. The attendance at concerts where classical music is offered is also a valuable help for nervous patients.

(Indebted to the Laboratory of Dr. Percy Brown.)

Case I. W. S. Y.

The first four prints show a small, active, high-placed stomach, the antrum of which is placed so far to the right that it conceals the first portion of the duodenum, except in the lateral position. The first print, ten minutes post cartum, shows the opaque meal well down in the jejunum. The second print, twenty-five minutes post cartum, shows the opaque meal in the jejunum, the head of the food-column being well toward the terminal ileum. The fifth print, three hours post cartum, shows the stomach to be entirely empty, the opaque meal scattered well through the ileum and jejunum, with the head of the food column already in the large intestine. The last print, six hours after the ingestion of the meal, shows the head of the food-column in the first portion of the descending colon, with only a small portion remaining in the small intestine.

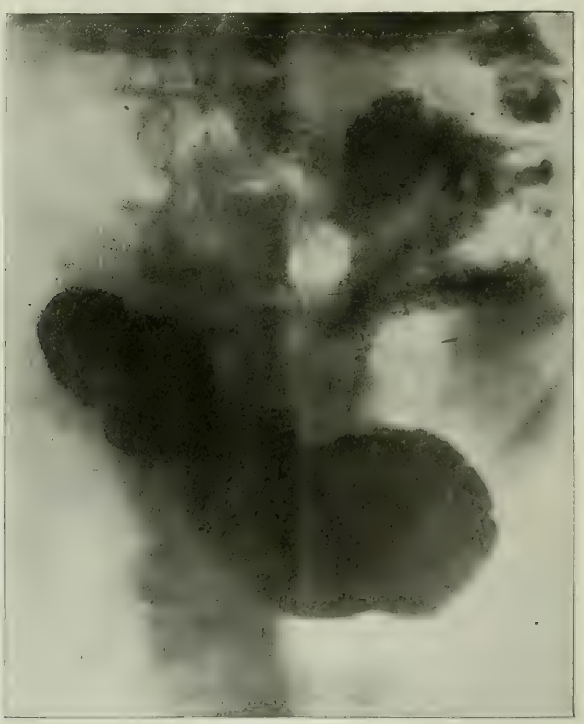

Fig. I. A. 10 min. Prone.

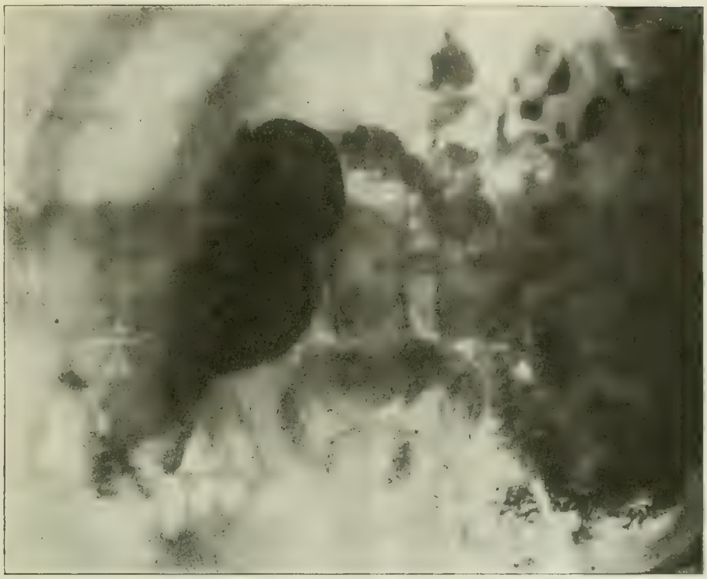

Fig. III. A. 45 min. Erect.

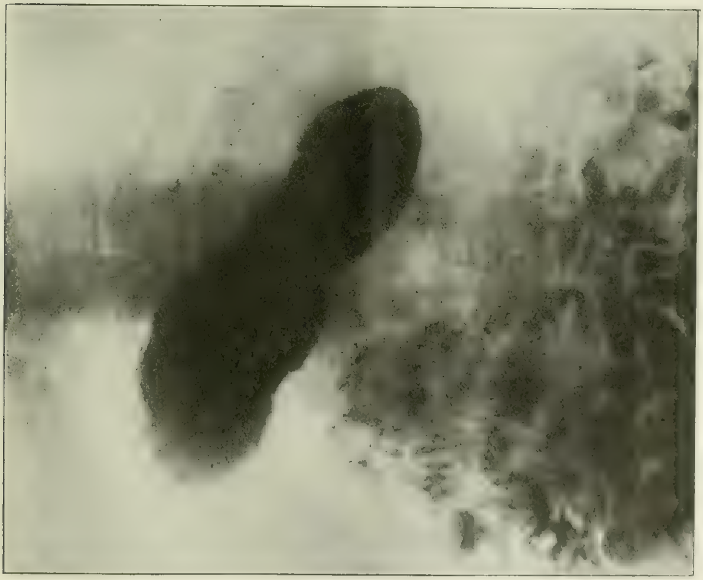

Fig. II. A. 25 min. Prone.

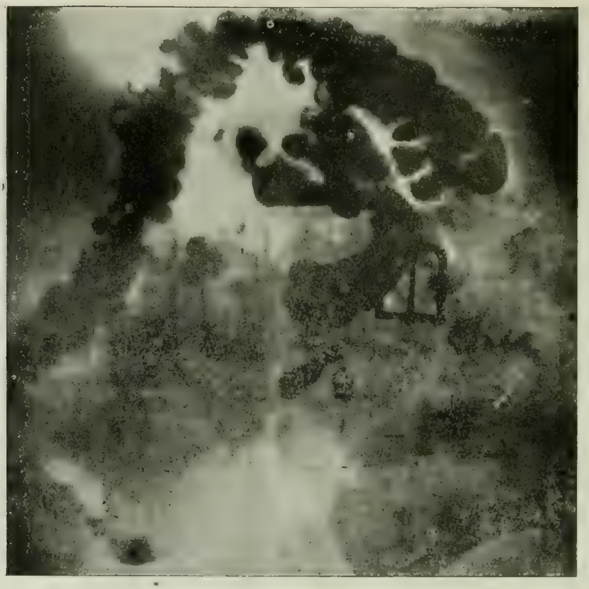

Fig. V. A. 6 hours. Prone.

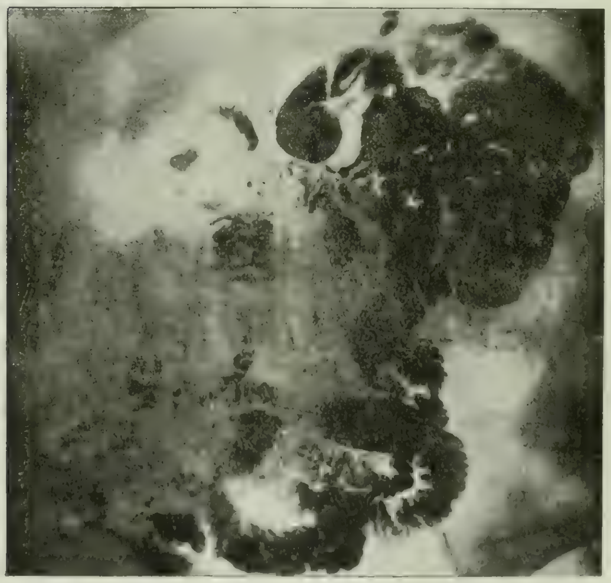

Fig. IV. A. 3 hours. Prone.

(Indebted to the Laboratory of Dr. Percy Brown.)

NORMAL STOMACH.

This is a somewhat large, rather low-placed, active stomach, normal for this type of individual. The pyloric region and first portion of the duodenum show well in about the ordinary position. Compare the head of the food-column of the opaque meal, its distribution through the small intestine, and the gastric residue at the corresponding periods.

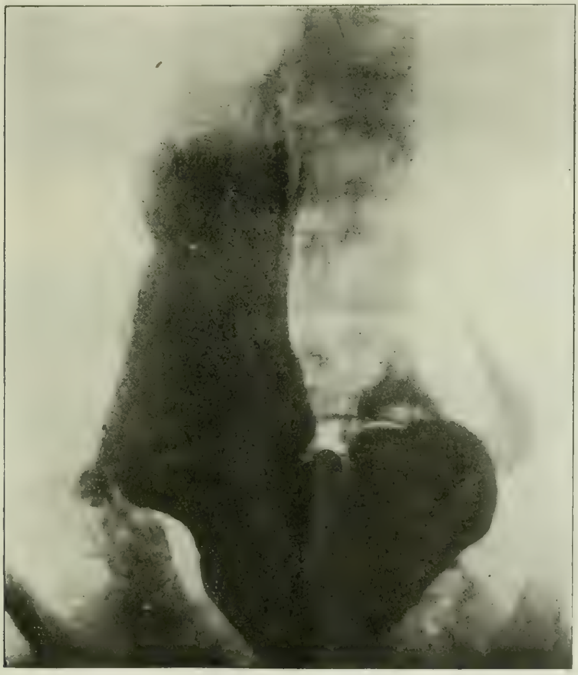

FIG. I. B. 10 min. Erect.

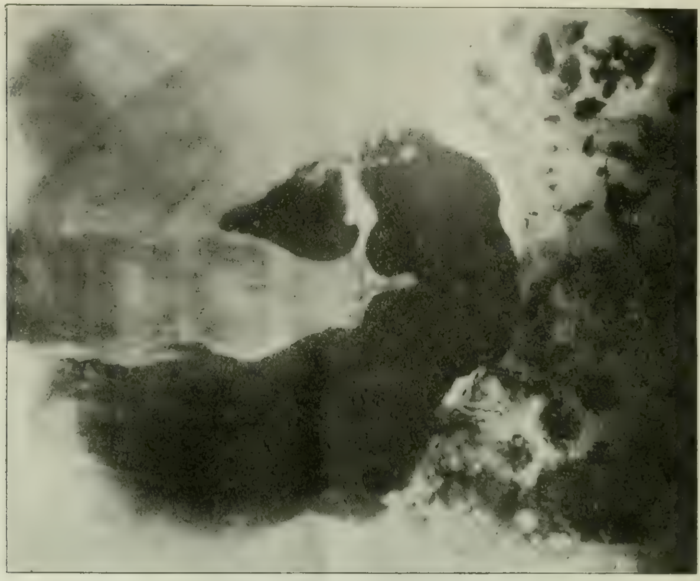

Fig. III. B. 35 min. Prone.

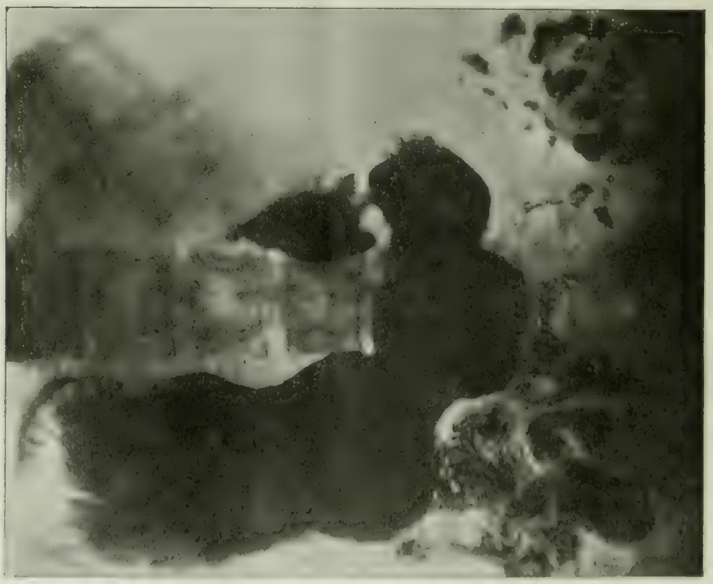

Fig. II. B. 25 min. Prone.

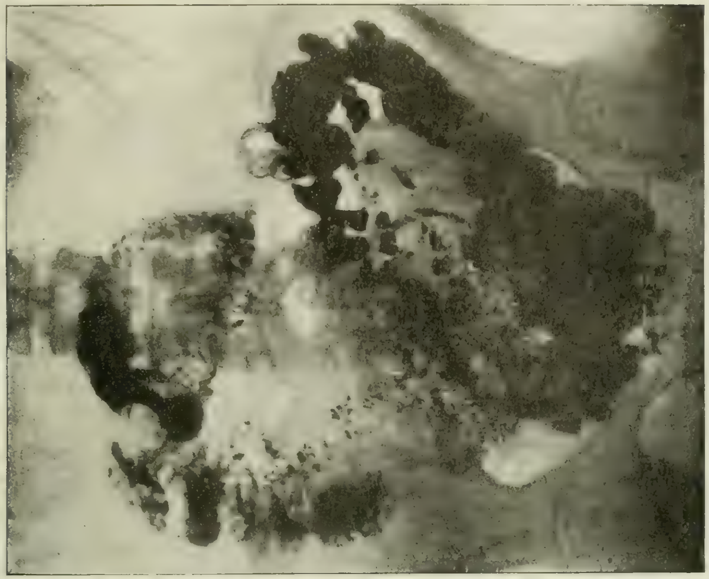

Fig. V. B. 6 hours. Prone.

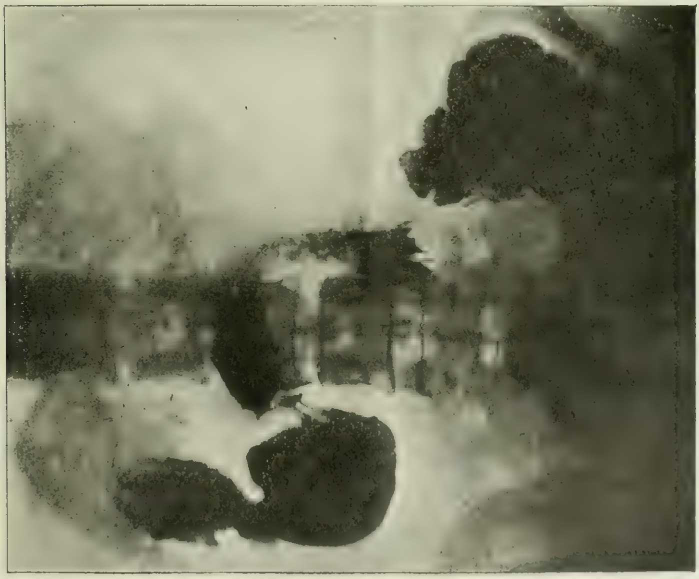

Fig. IV. B. 3 hours. Prone.

THE CEREBROSPINAL FLUID IN ANTERIOR POLIOMYELITIS. REPORT ON 108 CASES.*

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DURING the epidemic of anterior poliomyelitis last fall, about 150 cases of this disease were treated at the West Department (contagious) of the Massachusetts Homeopathic Hospital. Of these patients, the majority were subjected to lumbar puncture, and it is the results of the punctures (221 in all) which have furnished the material for the present paper.

All the patients here considered were admitted during the early postparalytic stage. The puncture was performed very shortly after the patient's entrance; many were repeated once or twice, nearly always on consecutive days. In short, we are dealing in this paper with poliomyelitis in the first week or ten days following the onset of the paralytic symptoms.

The following data were obtained on each fluid: pressure, color and appearance, number of cells per cu. mm. (using the Fuchs-Rosenthal chamber), with differential count; globulin content, using (when the amount of fluid permitted) the tests of Nonne and Apelt[1] (the so-called Phase I), Noguchi[2], and Pandy[3]. Ninety-four fluids were tested as to reducing power with Fehling's solution (equal parts of spinal fluid and Fehling's solution being brought to the boiling point together). The colloidal gold test of Lange[4] was applied to 21 fluids. The Wassermann test was not performed[5]. Bloody fluids were not examined.

Pressure. The pressure was increased in 154 cases, or 69.7%, the degree of increase being as follows: Slight increase, 31.7%; moderate increase, 32.6%; marked increase, 5.4%. These findings correspond in general to those reported by others.[6 7 8]

Appearance. Here, also, results were as expected.[6 7 8] Only 26 fluids, or 11.7%, were more or less turbid, the rest being clear and colorless. Only one fluid presented fibrin clot formation.[6 7 8 9]

Cells. In the very earliest stages of the disease (preparalytic), a transient polynucleosis may appear,[8 9 10] although the frequency of this phenomenon is questioned.[6] It is generally agreed that immediately after the onset of paralysis, a pleocytosis is demonstrable, and that from 75% to 100% of these cells are lymphocytes. The number of cells varies, as many as 990 per cu. mm. having been reported[8], but the number, whatever it be, gradually falls, so that at the end of the second week the cell count is almost always normal[9]. The cells per cu. mm. in this series were as follows: Under 10, 37.4%; 11 to 20, 22.5%; 21 to 50, 23.2%; 51 to 100, 10.3%; over 100, 6.4%. The highest count in this group—which does not include punctures made after intraspinous administration of serum—was 206. With but one or two exceptions, 50% or more of these cells were lymphocytes.

Following the intraspinous treatments,—whether normal or "immune" serum was used,—only 4 out of 56 examinations failed to show an increased cell count. In the majority of these counts, polymorphonuclear cells predominated[10]. The highest count in this group was 6500 per cu. mm.—an almost startling figure.

Globulin. It is now generally agreed[8 9 11] that the globulin excess is comparatively slight in the earlier stages of the disease, gradually increasing during the second and third weeks, and then again subsiding until normality is regained. Whatever course the globulin excess may follow, it certainly is not, as a rule, large at first[6]. In the series now under consideration, only 14 fluids failed to give positive results with the globulin tests applied. In nearly all cases this excess was slight (± or +). The tests employed yielded fairly consonant results, Pandy's method[3] giving a somewhat more marked reaction throughout. This latter statement is illustrated by the fact that, while by Nonne's[1] and Noguchi's[2], a marked globulin excess was demonstrated in only 1 case, Pandy's test indicated a similar condition in six; Pandy's test has the merit of simplicity and seems to fulfill the claim that it is more delicate than Nonne's. It is a question, indeed, whether it may not be so delicate as to lead to dubious results with normal fluids. In the author's hands, Noguchi's butyric acid test has proved most satisfactory. On account, however, of the very objectionable odor, which is an unavoidable accompaniment of this test, recourse will still probably be had largely to Nonne's method, which is both simple, reliable, and innocent of insult to the Schneiderian membrane.

The degree of globulin excess appears to bear no relation, in the present series at least, to the severity of the disease, the cell count and the pressure of the fluid, or the patient's temperature just before the removal of the fluid.

Fehling reduction. Authors[8 9 10 11] unite in saying that Fehling's solution is reduced by poliomyelitis fluids in virtually every instance. It is probably only in the cases presenting extensive and severe pathological changes.[12] that this property is lost. The chief significance of this test is in the differential diagnosis of poliomyelitis and meningitis, as in the latter condition a negative result is much more frequent (though far from universal[13]). Of the 93 fluids in this series, examined as to reducing power, all gave a positive result, the reading being in most cases + or + + (complete reduction= + + + +).

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* Read, in substance, before the Alethean Club, Boston, Feb. 9, 1917.

Lange reaction. Recent studies[14, 15, 16] have shown that the spinal fluid of patients suffering from poliomyelitis gives a fairly definite curve when the colloidal gold test is applied. The lower dilutions are reduced, the decolorization rarely, however, being complete. A typical curve in the acute stage[15] is 1 1 2 3 3 3 1 0 0 0. In the later weeks no constant rule is followed[16]. The chief value of this test, as of the Fehling reaction, seems to be in aiding to distinguish between poliomyelitis and the meningitides.

Of the 21 Lange reactions here reported, 14, or 66%, follow the general rule laid down in the preceding paragraph. The other curves are so anomalous that some technical error (the nature of which is at present unknown) must be invoked to explain them. Protocols are omitted here, as their presence would not add materially to the value of the paper.

A few words as to the significance of spinal fluid examinations in poliomyelitis may not be amiss. Such physicians (and the number is growing) as place any value upon laboratory reports, tend to rely on them as pathognomonic, neglecting the clinical aspects of disease in so doing. Their diagnosis may be termed reflex; for them the laboratory, instead of being, at the most, a staff to lean upon, has become a sort of mental perambulator. Fortunately or unfortunately, medicine has not yet been reduced to a question of chemical reagents and hemolytic systems; on the other hand, the value of the laboratory to the clinician must not be minimized. The physician who spurns the laboratory is at fault; but he who makes or reads a laboratory report without taking the patient into consideration, commits an even greater error. In poliomyelitis, especially, does this hold true.[6, 17] As we have seen, there is nothing in the chemical or cytological examination of the spinal fluid which can be considered characteristic of this disease. Yet the clinical diagnosis is sometimes far from easy; in such obscure cases the laboratory can aid us in differentiating poliomyelitis from tuberculous or purulent meningitis or meningism. If, first of all, a careful history is taken and a thorough physical examination made, it will frequently be found that the best the laboratory can do is to verify the clinical diagnosis. When this fact is understood and practised, indiscriminate lumbar puncture may cease so to captivate the fancy. In conclusion, the author wishes here to express his thanks to Dr. Helmuth Ulrich, Research Associate of the Evans Memorial, who performed the lumbar punctures and made the cytological examinations.

SUMMARY.

In the early postparalytic stage of anterior poliomyelitis, the spinal fluid usually shows a moderate lymphocytosis and a slight to moderate increase in pressure and in globulin content. Fehling's solution is reduced, but this phenomenon is of little diagnostic value.

A reasonably constant curve is yielded by Lange's colloidal gold test; this curve has some value in the differential diagnosis.

The picture is only fairly constant, and in the absence of positive clinical findings does not justify a diagnosis.

REFERENCES.

[1] Nonne, M., and Apelt, F.: Ueber fractionierte Eiweiss-Ausfallung in der Spinalflüssigkeit, usw. Arch. f. Psychiatrie, 1907-8, xliii, 433.

[2] Noguchi, H., and Moore, J. W.: Butyric Acid Test for Syphilis in the Diagnosis of Metasyphilitic and Other Nervous Disorders. Jour. Exp. Med., xi, 604.

[3] Pandy, K.: New Test for Protein in Cerebrospinal Fluid. Abstr. in Chem. Abstr., 1911, v, 3087.

[4] Miller, R. S., Brush, N. D., Hammers, J. S., and Felton, L. D.: Diagnostic Value of Colloidal Gold Reaction; Method of Preparation of Reagent. Bull. Johns Hopkins Hosp., 1916, xxvi, 391.

[5] Cf. Schottmüller, H.: Der Liquor cerebrospinalis bei Infektionskrankheiten insbes. im Zusammenhang mit der Wassermannschen Reaktion bei Poliomyelitis acuta epidemica. Münch. med. Wchschr., 1912, No. 37, p. 1988.

[6] Neal, J. B.: Laboratory Diagnosis of Poliomyelitis. Am. Jour. Pub. Health, 1917, vii, 144.

[7] Sophian, A.: Collected Study of 60 Cases of Meningitis and Conditions Simulating Meningitis. Arch. Pediat., 1911, xxviii, 201.

[8] Peabody, F. W., Draper, G., and Dochez, A. R.: Clinical Study of Acute Poliomyelitis. Monographs of Rockefeller Institute, New York, No. 4, 1912, pp. 98-107, especially.

[9] Ruhräh, J.: Poliomyelitis: Preparalytic Stage and Diagnosis. Am. Jour. Med. Sci., 1917, cliii, 178.

[10] Zingher, A.: Diagnosis and Serum Treatment of Anterior Poliomyelitis. Jour. Am. Med. Assoc., 1917, lxviii, 817.

[11] Batten, F. E.: Acute Poliomyelitis. Brain, 1916, xxxix, 115. See, especially, pp. 191-5.

[12] Abrahamson, H. L.: Spinal Fluid in Poliomyelitis and its Differentiation from Fluids of Other Infections. Am. Jour. Dis. Child., 1915, x, 334.

[13] Neal, J. B., and Dubois, P. L.: Diagnosis of Poliomyelitis. Am. Jour. Med. Sci., 1916, clii, 313.

[14] Johnston, M. R.: Study of Normal and Pathologic Cerebrospinal Fluids in Children Am. Jour. Dis. Child., 1916, xii, 112.

[15] Jeans, P. C., and Johnston, M. R.: Cerebrospinal Fluid in Poliomyelitis, with Especial Reference to the Lange Reaction. Am. Jour. Dis. Child., 1917, xiii, 239.

[16] Felton, L. D., and Maxcy, K. F.: Colloidal Gold Reaction of the Cerebrospinal Fluid in Acute Poliomyelitis. Jour. Am. Med. Assoc., 1917, lxviii, 752.

[17] Fischer, L.: Clinical Observations on Diagnosis and Treatment of Anterior Poliomyelitis at Willard Parker Hospital. Med. Record, 1917, xci, 52.

Massachusetts Society for Mental Hygiene.

DR. SAMUEL G. HOWE AND THE BEGINNING OF WORK FOR THE FEEBLE-MINDED IN MASSACHUSETTS.*

By Frankwood E. Williams, M.D., New York City,

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Before giving ourselves to the consideration of the papers which have been prepared for this Conference, it is fitting that we should stop for a few moments to pay tribute to the memory of the man who preceded us all in this work, the man who first aroused the interest of the people of Massachusetts in the problem of the feeble-minded, and who laid the foundation upon which we now build the superstructure—the Boston physician-philanthropist, Dr. Samuel G. Howe.

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* Read before the Conference on Feeble-mindedness of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Dec. 13, 1916.

For more than forty years, Dr. Howe was a leader in philanthropic movements in Boston. His office, at 50 Bromfield Street, was a center to which those engaged in the problems of the day came for counsel and advice, for renewal of courage and vision. It is not difficult to understand the reasons for his leadership. Many elements, no doubt, combined to create it—his earnestness, his unselfishness, his disinterestedness, his sagacity—but none was more effective than his pioneering spirit. His interests were wide—wider than the day's trail. Conventional philanthropies did not hold him. He was curious, venturesome, spirited. The unexplored, the tangled by-paths drew him. What others overlooked, he stopped to examine. Where others turned away, he plunged in.

Dr. Howe was graduated from Brown University in 1821, and from the Harvard Medical School in 1824. At the time of his graduation from the Medical School, the Greek Rebellion was in progress, and Dr. Howe threw in his lot with the Greek patriots and sailed from Boston to become a surgeon in the Greek cause, even as Boston physicians are today contributing their services to the war hospitals of Europe. He served Greece for six years in the capacity of surgeon, co-patriot and soldier when need required, and as organizer and dispenser of American relief. Samuel G. Howe was the Herbert C. Hoover of the Greek Rebellion.

The same love of freedom which had led him to Greece, later led him to Paris at the time of the July revolution, where, heedless of the danger to himself, and against the remonstrance of Lafayette who feared for his safety, he marched with the French leader through the streets of Paris when Lafayette took command of the revolt. He continued his journey to Brussels and took part in the "scrimmage there," which later led to the independence of Belgium.

He returned to the United States in 1831. There was some talk of his taking charge of the negro colony of Liberia, but negotiations failed. He became interested in the project, then being discussed in Boston, for teaching the blind. There were at this time no schools for the blind in this country. He accepted the superintendency of the school about to be established and sailed for Europe to study the European schools and methods. While in Paris he was again called upon to serve in a larger capacity and was made chairman of the American-Polish Relief Committee. Lafayette urged upon him a visit to Prussian Poland, to carry money to the Polish refugees for clothing and food. It was a dangerous mssion as the Prussian government was suspicious and unfriendly. He went. Alone in the interior of Prussia, surrounded by Prussian soldiers, his discretion is overcome by his emotion as a body of disheartened Polish prisoners march by, and he throws up his hat and cheers. Although he fulfilled his mission to the refugees, it is not surprising to learn that he was greatly handicapped by the Prussian government and that on his return to Berlin he was thrown into prison where he remained *incomunicando* until, at the end of six weeks, he succeeded in smuggling news of his situation to the American minister.

Returning to America he opened the first school for the blind in this country—the Perkins Institute. The methods of printing for the blind then in vogue were so difficult and expensive as to preclude extensive use. His active mind was soon at work on the problem, and he devised a method which revolutionized such printing, and made possible libraries rather than books for the blind. His experiments in teaching were watched with interest and, once he had demonstrated the wisdom and practicability of teaching the blind, his school and methods were copied elsewhere. Thus a new world was opened to the blind of America. Dr. Howe's most famous pupil was the deaf, dumb and blind girl, Laura Bridgman. Dr. Howe remained superintendent of the school which he founded until his death.

He was keenly interested in the work for the insane, which was just beginning in Massachusetts, and with others was instrumental in establishing the first hospital for the public care of the insane in this state, and one of the first in the country—the Summer Street Hospital in Worcester. He was ever the champion of this new philanthropy.

A dispute having arisen between Horace Mann and others over the best method of teaching the deaf and dumb, Dr. Howe became interested in this new field. He took into his school two deaf-mute children and began a series of experiments which finally had a share in leading to the establishment, in the neighborhood of Boston, of a small school devoted to the articulate method of education—the first school of its kind in the country—and later to the founding of the Clarke School for the Deaf at Northampton.

Dr. Howe was chairman of the first State Board of Charity organized in this state and, as chairman of that first board, laid down principles which are observed today. Large charitable institutions he held to be an abomination and not to be tolerated except where absolutely necessary. He, therefore, advocated and developed—and the method is still being used successfully today—family care for certain types of the insane. And it is to him that we owe a principle of which Massachusetts is very proud—that orphaned children should not be congregated in large asylums, but that suitable homes should be found for them where they could be boarded, if necessary, at the expense of the state.

He was active in the anti-slavery movement, was chairman of the Boston Kansas committee, and an adviser and friend of John Brown. And finally, as we shall see, it was he who was instrumental in organizing the first school for the feeble-minded, not only in the State but in the country.

Dr. Howe's interest in the possibilities of teaching the idiotic came as a result of the success with which he had met in teaching in his school, certain blind, idiotic children. At this time there was no provision in this country for the care of the idiotic. Teaching them had never been considered. Europe had done little more, although there were some custodial institutions. Pauper idiots in this country were left largely to the mercy of the almshouse-keepers, and in the almshouses where they were not understood the helpless idiots were neglected and frequently grossly abused. Science had not yet interested itself in an attempt to understand these individuals. So far as anyone knew, idiots were merely a trial and a punishment sent by God. A popular notion prevailed that poulticing the head might be of help, and in cases where impressions were apparently not retained, cold poultices of oak bark were applied to the head to tan and harden the fibers. In cases which were hard to impress, hot or softening poultices of bread and milk were applied, or the skull was plastered with tar which was left on for varying periods of time. Tremendous doses of calomel were given in other cases, to "mend the brain," it being supposed that the mercury acted as a solder and "soldered up the openings."

As a member of the Legislature in 1846, Dr. Howe succeeded in having passed a bill creating a commission which was "to inquire into the condition of the idiots of the Commonwealth, to ascertain their number and whether anything can be done in their behalf." Dr. Howe was made chairman of this commission and wrote the report. A partial report was made in 1847; a full report in the winter of 1847-48. Considering the time, the almost complete lack of information in existence on the subject, the difficulties under which the work was done, and the fact that this was the first investigation of its kind ever made, these reports, in comprehension of scope, in information obtained and in spirit are nothing short of marvelous. Hopeless as the education of the idiot seemed to be, the reports were sufficiently convincing to induce the Legislature to appropriate $2,500 a year for three years for the experimental teaching of ten idiotic children. These experiments were carried on by Dr. Howe at his school for the blind. At the end of three years the work was found to be so promising that the Legislature created a new school known as the Massachusetts School for Idiotic Children, and increased the annual appropriation to $5,000 a year. Thus was established, through the efforts of Dr. Howe, the first school for the feeble-minded in the country. So genuine and so keen was Dr. Howe's interest in the work, and so great his belief in it, that for over ten years he contributed his services to the State, and without salary served as superintendent of the new school.

Dr. Howe did not deceive himself, or try to deceive others, as to what might be accomplished in the training of idiots. His chief object was to arrest, in these individuals, deterioration and degradation. "Many die young," he said, "but those who grow to manhood, especially those in our almshouses, sink lower and lower in degradation as they advance in years. This, surely, should not be; if no one else will prevent it, the State should. They were born with capacities for improvement—let this not be extinguished; they were born idiots only— let them not die brutes!" He did not expect that the idiots would ever gain such acquaintance with the common branches of learning as would be of much ornament or direct use to them. "It is not expected that they will be raised to a level with ordinary persons or play an independent part in the world and take care of themselves, but it is hoped to train them up in cleanliness and decency, to prevent or root out vicious and debasing habits; to moderate their gluttonous appetites; and to lessen the strength of their animal natures generally by calling into activity the higher feelings and desire, and by substituting constant occupation for idleness. It is proposed to train all the senses and perceptive faculties by constant and varied exercise; to strengthen the power of attention; to teach, as much as possible, the rudiments of knowledge; to develop the muscular system; and to give some degree of dexterity in simple handicraft.

"Efforts will be made to call out their social affections, and to lessen their inordinate selfishness by awakening some feeling of regard for others, in return for kindness and love manifested toward them.

"The still harder task will be attempted of appealing to the moral sense, and drawing out what little capacity there may exist for comprehending right, for exercising conscience, and for developing the religious sentiment.

"It is hoped that part of them will gain some really useful knowledge; that most of them will become cleanly, decent, temperate, and industrious; and that all of them will be better and happier from the efforts made in their behalf."

In reading Dr. Howe's reports it is a constant surprise to learn how fully he grasped the situation. There is little in our modern work that he did not at least foresee or sense. He clearly differentiated between idiotic persons and demented persons, a distinction that was not generally made at the time. He recognized the difference between the retarded child and the idiotic child. He recognized the child with specialized defect. He recognized both quantitative and qualitative mental differences.

He recognized that there were, probably, many causes which lead to idiocy, but he named as the three chief causes—heredity, alcohol and vice. He may have over-emphasized somewhat the influence of alcohol—but hardly today are we in a position to either correct him or approve him in this matter, and if for vice we read syphilis, his causes become modern.

As to heredity, he says: "Regarding it as a matter relating to the mere animal man, if a farmer had swine, cattle or horses as inferior to others of their kind, as many of these people are inferior to other men and women, he would pronounce them unfit to breed from; such persons are indeed unfit to continue the species, for while they multiply its numbers they lessen its aggregate powers. . . This subject of the hereditary transmission of diseased tendency is of vast importance, but it is a difficult one to treat, because squeamish delicacy makes people avoid it; but if ever the race is to be relieved of a tithe of the body ills which flesh is now heir to, it must be by a clear understanding of and willing obedience to the laws which make the parents the blessing or the curse of the children; the givers of strength, and vigor and beauty, or the dispensers of debility, and disease, and deformity."

His clinical observations were accurate. He recognized the different types, and the varying social significance which the different types might have—the mild, affectionate and docile, and, on the other hand, those "who are a helpless prey to dreadful passions, depraved appetites and disgusting propensities."

Aside from the terminology, his classification is modern. Binet tests or Yerkes tests were, of course, unknown in that day, but Dr. Howe devised a method of his own, based upon the ability of the child to use and understand some kind of language as signs of thought. His discussion of this method and its use fill one with admiration and respect for the man who, in that early day, could have devised it. One recognizes in it the elements of many of our modern psychological tests. We recognize the idiot, the imbecile and the moron. Dr. Howe termed them the idiot, the fool and the simpleton. Whether he was the first to suggest the term "feeble-minded," I do not know, but in his first report is this statement: "Evil may arise from the misuse of the term 'insane,' as the name of a class, if it causes them to be considered as a distinct order of persons and different from other men in being utterly devoid of mind, for it will be considered useless to try to teach those who have no minds at all; but if they are considered as differing from others not in kind, but in degree only—as merely having feeble minds—then their very feebleness, like that of little children, will commend them to our hearts." His educational methods are largely the methods of today, emphasis being laid upon sense training, neuromuscular control, dexterity, simple handicraft, open air, proper diet and exercise.

The institution, thus begun, grew and demonstrated its worth. Dr. Howe's great hope, expressed at the beginning, became true, "If the experiment should succeed, the good done to the ten individuals who are the subjects of it, compared to the good that must follow to others, will be as the grain of mustard seed, to the goodly tree in whose branches the fowls of the air find rest. The capacity of idiots for development once shown, Massachusetts will gather them from the almshouses and the by-places and give them careful nurture and instruction; and when Massachusetts shall show to her sister states these redeemed ones, snatched from the slough of brutishness, and made tidy, and decent, and industrious, and happy—then this example of true and practical Christianity will be followed by others; and thousands who are now groveling in filth and depravity, and wretchedness, the pariahs of civilization, will be brought back to the bosom of society and treated with that kindly regard to which their calamity entitles them."

A satirical production of those days presented Dr. Howe and Charles Sumner in the light of knights-errant of philanthropy, constantly on the lookout for some human right to vindicate, some injury to redress. As his biographer points out, Howe was more than a knight-errant, he was a chevalier.

Whether engaged in the cause of Greek freedom, whether active in the French and Flemish revolt, whether carrying aid through unfriendly Prussia to the Polish refugees, whether founding the first school and opening up new worlds to the blind, whether active in establishing the first school for the deaf and dumb, the first school for the feeble-minded, the first hospital for the insane, or whether as chairman of the first State Board of Charity, laying down those wise principles of public charity which we follow today, or whether active in the abolition movement—Dr. Howe's life was a life of service to others and, in most cases, service to those who were helpless, who could not help themselves, and who had no friends except those he himself raised up for them. Through his wisdom, foresight and vision, it is possible for us to gather here tonight to lay plans for carrying on the work which he began seventy years ago.

FEEBLE-MINDEDNESS AS AN ELEMENT IN POVERTY.*

By Robert W. Kelso, Boston,

Secretary Massachusetts State Board of Charity.

For our purposes the word *poverty* means the more or less chronic insufficiency of the means of keeping a reasonably sanitary abode and enough food and clothing to maintain the body in good working condition—plus the additional means of like maintenance for those properly dependent.

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* Read before the Conference on Feeble-mindedness of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Dec. 15, 1916.

It has two aspects: that is to say, the family that somehow gets along without charity but which lives in an inadequate home and starves itself into an early grave; and the family that, failing even in this, comes upon private benevolence or the public rates for its necessary support. These two aspects are but degrees of one and the same condition. The reasonable standard of living which this definition implies, represents the poverty line. Above it dwell something less than nine-tenths of all our citizenry. Below it lie something over ten million men, women and children in this free country.

Why, then, are the poor in poverty? There is no one cause for poverty. There are in the world this afternoon millions of men, hard-working, honest, intelligent and gentle, who have not the means wherewith to buy their children bread. There are hundreds of bodies lying this moment in the morgues of American cities—the bodies of old men and women who have toiled honestly all of their lives, spurred on by the fear of a pauper's grave, and who have, nevertheless, died in the poorhouse. No discussion of ours then should seek to explain away those hard conditions which the competitive struggle for bread has imposed.

However, it is not only competent, but highly commendable that we seek to analyze some of those many causes for present poverty, to the end that we may possibly discover a primal source from which they flow. Here is a family too poor to get along without public aid. The father and some of the children have tuberculosis. It is an intelligent family, willing and eager to work. It lacks only the strength. It lives in a miserable hut that breeds disease. It has always lived there. Disease is given as the cause of poverty. But we should look back into the preceding generations to find a cause for the tuberculosis.

Here is another family of a deserted wife and five small children. She is eager to work and does work, but it is not enough. She is in poverty. The husband has abandoned his trust. The desertion is the popular cause of the distress.

And here again is a family group of an aged grandmother, her daughter and three little grandchildren. The father of these children has been killed in an industrial accident. He was a pretty steady drinker. The accident is the statistical cause of the dependency.

For the purposes of social analysis, those causes will not do. Some of them, if carefully studied, will turn out to be occasions rather than causes. Tuberculosis is a famous seizer of opportunity. Alcohol, though boasting many converts from the ranks of the highly intelligent, gets first and most frequently into the head that has least power to visualize the consequences, least strength to appreciate the scope of life's daily problem.

Back of those superficial causes, whether it be in the immediate generation or in the next or the next—keep going and you are pretty sure to find it—you will discover a fatal lack of judgment, a defect of will, a mental dullness that has brought this train of troubles to its progeny.

Back there at the branch roads there has been a failure to discern the right road to take. "There is a tide in the affairs of men, which, taken at the flood, leads on to fortune. Omitted, all the voyage of their lives is bound in shallows and in misery."

The tuberculosis, the syphilis, the inebriety, the uncontrollable temper of today, are but the physical symptoms resulting from that lack of insight, that failure of judgment which turned the affairs of that family into its sequence of miseries and has since maintained it there. Make full allowance for the operation of economic forces. Say, if you will, that monopoly of capital and of labor are grinding the breadwinner,—and I for one believe that business America is an almighty long way from being free and impartial in its opportunities,—give full scope, I say, to environmental conditions, and you must still reckon with that original cause—the human equation.

It would be trite to say, "the better the mind, the better the judgment," and yet that comment is basic. I want to call your attention to a few of the defective families that have been studied, to find, if we can, any social connection between the defect and the condition of poverty in which those families have been invariably found.

One of the seven wonders of Indiana is the tribe of Ishmael. Five thousand persons in six generations have been traced and the mental status of a great many roughly ascertained. The record is one of feeble-mindedness passed down from parent to child. This is the great stream of destiny in that family. Lying along its course, like stagnant bayous filled with the slime and decay of society, are those other attendant facts,—prostitution of about half of all the females, crime record for nearly half the men, syphilis rampant, illegitimacy preponderating, and pauper aid to such an extent as to absorb three-fourths of all the public poor relief funds of the county. If the condition of that tribe is an economic or political accident, then Indiana has the miracle of Jonah relegated to the advertisements.

Look at the Jukes of New York State. They were a shiftless tribe, a spreading clan of ne'er-do-wells. Out of 709 individuals traced in several generations, 180 had either been inmates of almshouses or had been in receipt of public aid. Dugdale estimated that the relief thus given would have amounted to full support for a single individual for 800 years. A low estimate for the 500 individuals who were known to belong to the tribe, but who have not been traced, would have lengthened this period to 1150 years; and that represented a study of the overseers' records for only 64 out of the 255 years during which this group was receiving public relief. They are a tribe of hereditary paupers, which is another name for hereditary worthlessness. And that, in turn, we have come to know, is a paraphrase for hereditary mental dulness or feebleness of mind.

Insufficient mentality to have the will to be respectable and self-supporting—that is the record of the Jukes. Incompetency is their premise; poverty is their conclusion.

Turn to the hill folk here in our own Commonwealth:—737 persons in 5 generations were traced; 65 of these had received public relief; 37 of this number were state wards; 48% of the entire group were found to be feeble-minded, and if the tendency to strong drink be compounded to a one-man basis, there would be about 600 years of heavy drinking and 300 years of medium drinking—a mild estimate of the whiskey bill would have been $64,000. Davenport estimates that the total cost to the State, of the prosecution, support and loss of earning power caused by this tribe would be about $500,000. Over $60,000 of it was pauper support. And yet these figures go back only 60 years. The amount of town aid which the one tribe has required decennially has increased 400% in the past 30 years. Thirty-seven of their children have been state minor wards. Half of all the school children from this group show mental deficiency. They are the future parents, who must use their judgment and their will power to keep themselves and their dependents above the poverty line, and half of them are born short. And what of the other half? Their origin is against them. They do not appear to be dull-headed enough to be called feeble-minded. Who can say that they will be wise enough to turn the tide and voyage of their lives away from shallows and from misery?

The Nams are another tribe of dull-minded people—living in abject poverty, squalor, chronic immorality, chronic inebriety. Seven hundred and eighty-four persons in eight generations have been traced. The tribe is economically helpless. Its members have no judgment and no determination, and because they lack these, they possess no substance. They save nothing. Their bodies are diseased; their minds as dull as the clod. . They are brindle stock, of no earthly use as citizens,—the fertile soil of social disease. So long as such groups are guaranteed the constitutional right to life, liberty, and the pursuit of happiness, merely as they understand it, without demanding that this privilege be extended in the light only of the public welfare, just so long will poverty stalk through the land, and we shall continue to see the disgraceful spectacle of starvation in the midst of times and conditions claimed to be rich and prosperous. The way to reduce poverty of the chronic sort is to breed a better citizen.

Let us not lay undue emphasis upon these particular family studies; they are the merest straw to show the direction. In almost every community of any size in the country they can be duplicated. Davenport makes the general comment that "The rural communities of 'degenerates' usually have this in common: an unusual lack of industry, retardation in school work, and a failure to observe the conventionalities in sex-relationships. They work when the mood overtakes them; consequently they remain poor."

Scan as we may the record of poverty; make full allowance for the hard economic conditions that drive the honest toiling citizen below the poverty line, after a long life of industry; reckon with the baneful effects of a theory of economics which demands free competition to the remotest degree and a practice the world over which has far outgrown it; recognize the claims of sickness, accident, and the rigors of climate. Make all these allowances, and we still come down to the unmistakable conclusion that feeble-mindedness, not only of the legally ascertainable degree, but of all degrees affecting judgment, is probably the greatest source of that poverty which knows no elevation. Beginning there, our path leads to those physical conditions which we are in the habit of recognizing as the causes of poverty. They are not causes; they are symptoms; the tuberculosis which seems to have wrecked the X family is not so important in our study as the fact that the tubercular father spits all over the floor. That is the fact that puts wife and children in peril. Potential breadwinners are wrecked through that carelessness, and as people go, while the reasonable and sensible man is often careless, the mental defective is invariably so. The syphilis that has wrecked this other breadwinner may, and often does, beset the steadily-working citizen, but its easy mark is the mentally, morally obtuse individual who hasn't judgment enough either to avoid it himself or to guard against passing it along to his offspring. Many men of stolid mind become drunkards, but the mentally weak are its readiest victims, and yet we hear it said that poverty would shrink by half if the abuse of alcohol could be done away with.

No consideration other than this close relationship between feeble-mindedness and poverty could with equal force bring out the true significance of that dreadful fact about feeble-mindedness,—namely, that it is hereditary in at least 80% of the cases.

The practical definition of a feeble-minded person is one who, though capable of providing his living with his hands, is unable, by reason of mental defect, to make his living in competition with his more intelligent fellows. When we realize that the feeble-minded citizen is by definition a pauper, and when we further consider that the condition breeds as true as the spots on a dog, we can vaguely picture to ourselves the tremendous social saving in preventing their propagation, and the incalculable social waste attending our neglect to catch this social opportunity at the flood tide.

WHAT IT MEANS TO HAVE NON-COMMITTED FEEBLE-MINDED IN THE COMMUNITY.*

By C. C. Carstens, Boston,

Secretary, Massachusetts Society for the Prevention of Cruelty to Children.

The progress which physicians and alienists are making during the present decade in the recognition, training and care of the feeble-minded is having an influence of the greatest importance upon the social case worker, only to be compared with the influence exerted by the work of societies for the care and prevention of tuberculosis in a previous decade. As in the case of tuberculosis in the past, so, until recently, case workers have thought that feeble-mindedness was one of the visitations of Providence. It was the duty of the State to provide for the unfortunates when, because of destitution or other reasons, relatives were unable to do so, and the feeble-minded were generally left in institutions or discharged at the request of relatives or friends. In certain States a more rigid policy was pursued, but the social implications of feeble-mindedness were not understood by any considerable group of citizens.

The progress of the last few years has pointed out a new lesson. The case worker is finding that his most stubborn problems of relief, delinquence, neglect, cruelty and illegitimacy are in so many instances associated with clear or border-line cases of feeble-mindedness that the principles of social case work are either being confirmed or put on a more substantial foundation. For example, the almshouse pauper type has for many years been recognized when found in the almshouse, but we can now find it while the pauper is still living in the community, beginning to depend upon public and private charity whenever domestic or economic stress is felt in any unusual measure, and long before the process of physical and moral degeneration has driven him as a last resort to the almshouse.

Again, it has been long known that the case of the young mother with one child born out of wedlock is very different from the usual case of the mother with two or more illegitimate children. We got half way at the truth when we reasoned that the girl with one child, who out of that experience became a moral, upright woman, had the mental and moral stamina to learn the lesson of experience from her terrible plight of illegitimate motherhood, and she went and sinned no more; while the evidence of the two or more illegitimate children in another case proved that the girl was not or had not been able to learn that lesson, and must be thought of as a moral weakling. But now comes the alienist, to prove that the case of repeated illegitimacy is frequently but a manifestation of mental deficiency, so that the case worker immediately questions mentality when a mother with an illegitimate child is found, with the hope that further illegitimacy may be avoided.

This change in attitude and method in case work, growing out of the progress that scientists have made in eugenics and mental hygiene, would make an interesting subject of study for the social worker. But we can only hint at it here. Our task is rather to point out how the uncommitted feeble-minded still complicate the problem of the case worker, and how far a community must still go before it may claim to have ample protection against the burdens that feeble-mindedness brings to it. There is no single case work organization, no settlement, no educational and civic association that does not have to reckon with the weaknesses that feeble-mindedness brings in its train. They are so manifold in their manifestations that they cannot be presented within the confines of a short paper. Following are a few typical illustrative examples:—

1. *Pauper Marriage.*

While the mother was at the Long Island Hospital for confinement of her illegitimate children, she became acquainted with her husband, who had been an inmate there many times. She bought her own wedding ring, paid for the issuing of the license, and has contributed to her own and the children's support much more than her husband has at any time. As a matter of fact, he has been on the Island much of the time since the marriage, and seems a selfish, lazy pauper. Fortunately, there is but one child living of this marriage. After several years of the mother's drifting in and out of Long Island, a social worker proposed that she be examined while there. Upon examination, she was found to be feeble-minded, and, after a good deal of difficulty, was committed to the State School at Wrentham. At some time within the last seven years the following agencies, which is by no means a complete list, have devoted time, money and effort to the support and care of the members of this family: The Boston Juvenile Court, the Home for Destitute Catholic Children, the South End Day Nursery, the Boston Overseers of the Poor, the Boston Associated Charities, the Boston Dispensary, the Instructive District Nursing Association, the Boston Children's Aid Society, the Children's Mission, and the Massachusetts Society for the Prevention of Cruelty to Children.

2. *The Dependent in the Community.*

A young woman, born in 1892, who has had at least four illegitimate children, has been most promiscuous in her sex relations. She has been living in the lodging houses of the South End district of Boston, and like a leech, has clung to lodging-house keepers, whose generosity, patience and sympathy she has invariably enlisted and abused. When in trouble, various charitable agencies were turned to, and assisted in one form or another. Among these were the Society for Helping Destitute Mothers and Infants, the Salvation Army, the Children's Hospital, the Division of Minor Wards of the Massachusetts State Board of Charity, and the Massachusetts Society for the Prevention of Cruelty to Children. With an increasing recognition of the marks of feeble-mindedness, an examination was brought about, and it was found that she was a border-line case of feeble-mindedness, but not considered committable. She has neither self-control nor shame. While at court to enforce the payment of support against the father of one of her illegitimate children, she was making appointments for immoral purposes among the hangers-on in the corridor of the court house.

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* Read before the Conference on Feeble-mindedness of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Dec. 11, 1916.

3. *Adoption of Child by the Feeble-Minded.*

In one of the probate courts of the State some four or five years ago, a lawyer presented a petition for the adoption of an infant by a woman living at that time in this State, the petition having been assented to by both parents. The petitioner was a feeble-minded hunchback, who worked about two weeks in this State and then removed the child to New Hampshire, where it became dependent. She bore a bad reputation, drank and smoked habitually, and used morphine. Efforts have been made to revoke the adoption, but without success so far.

4. *Immorality and Feeble-Mindedness.*

In this instance there are feeble-minded twins of 17,—a boy and a girl. The father is clearly of low mentality and is constantly losing his work because of his drinking habits. The mother, who died of tuberculosis in 1907, had a record for being peculiar, but was not deemed sufficiently insane to commit. The children of the second wife are being cared for by one of the private charitable agencies. There is a third wife, who is a very poor lot. She drinks and is immoral, and lives in the vicinity of the Charlestown Navy Yard. It was not surprising under these circumstances to find the girl inclined to commit immoralities with sailors, and when she was brought before the court it was discovered that she was 8+ in mental development. There was no vacancy in the institutions for the feeble-minded at that time, and she was, therefore, committed to the Industrial School for Girls at Lancaster. The boy was examined at the same time, and his mentality found to be still lower. At the present time he is working regularly and seems tractable, and an aunt of good reputation is looking after him.

5. *The Clandestine Prostitute.*

She was the mother of two children when brought to our attention, the older of whom was illegitimate. There were with her also two children, 14 and 16 years of age, of the man's former marriage. He drank and was apparently as irresponsible as the woman. Sometimes she would take up with one man for a time, but her sex relations were most promiscuous. Not long after the problem came to our attention, the children were removed from the mother's custody. The paternal grandmother provided a good home in a neighboring town, and upon her plea the children were placed with her, but not long after turned over to the mother again. Several years later the Society was drawn in to protect a group of children in an entirely different part of the city, who were identified as the same group above referred to, with the addition of two illegitimate children born since the husband had left the mother. Complaint was made against the mother of lewd and lascivious cohabitation. She was examined when brought before the court, tested eleven years and pronounced a defective delinquent. The children were committed to the Massachusetts State Board of Charity, and have thus become wards of the State and an expense for many years to the Commonwealth, but the mother, after a short sentence, is again adrift.

6. *The Border-Line Delinquent.*

She was 16 years of age, the youngest child of five. Because of her father's and mother's intemperance and the separation which resulted from it, the child had been dependent upon charitable people and charitable institutions for a number of years. She drifted about a good deal, and finally the father placed her in the House of the Good Shepherd. She succeeded in getting out of there by cutting a vein in her wrist and being transferred to the City Hospital, and the sisters in charge did not feel that they could have her returned. Soon after this the Psychopathic Hospital pronounced her backward, but not feeble-minded, and on later examination she was found to be four years retarded,—a border-line case. As a result of this diagnosis, she was committed to the Trustees for Children of the City of Boston. She has run away from her foster home at least once, and it is easy to see that the end of the community's experience with her is not yet.

7. *Young Mother with an Illegitimate Child.*

She was only a slip of a feeble-minded girl of 14, but she had been immoral with so many men and young boys that she could not tell who the father of her child was. The infant was born in the Talitha Cumi Home, and against the wishes and requests of those most interested, the girl's mother insisted that she and the baby come home. Her father, a hard drinker, had left his family several years ago. The mother was not very bright, but was struggling along to make ends meet. She took a genuine interest in her daughter and grandchild, and gave a great deal of attention to the latter. A few months after the girl returned home she again began her immoralities, and her mother was then willing to have her sent to the State School at Wrentham. Her mother is caring for the baby. Three different children's agencies have devoted much time and effort to the work in this case.

8. *Immoral Relations Between Children of the Same Family.*

In this instance the father was a periodic, hard drinker. The mother was dead. The stepmother was accused of the vilest practices with her stepchildren. The 14-year-old girl and the 13-year-old boy, according to information that seems reliable, had been taught these practices by the stepmother. The girl was found to be a border-line feeble-minded case. She finally ran away from home and was committed to the Industrial School for Girls at Lancaster, and the boy was sent to the Lyman School for Boys. Not long after this the father was sentenced to three months in jail for larceny, and his stepson, to six months for lascivious acts. A thorough mental examination of all the members of the family would be liable to reveal others feeble-minded besides the 14-year-old girl.

9. *Great Expense in Money and Effort Wasted.*

In this particular family the father had deserted in 1908 and had not been seen since. An imbecile boy was committed to the Wrentham State School about the same time that the 14-year-old girl was placed in the House of the Good Shepherd. The sisters gave the girl up as incorrigible and the court then placed her in the custody of this Society, who enlisted the interest and service of the Boston Children's Aid Society. The two societies struggled along for a number of years to find good homes for the girl and to keep her contented and tractable when placed in such homes. Finally the Children's Aid Society had her examined and found her a committable feeble-minded child. There was no room in either of the schools for the feeble-minded at that time and she was therefore committed to the State Board of Charity, and an application made for her admission to the Wrentham State School when a vacancy should occur.

10. *Child Awaiting Deportation.*

The father and mother in this case are of foreign parentage. The mother has been at least once in the State Hospital at Taunton. This girl of 15 was reported by the school teacher as spreading evil reports about her mother, and the mother, when interviewed, made similar immoral accusations against the girl. It was discovered that the girl had arrived in America only four months previous to this time; that she had been immoral before her arrival and since, and that since her arrival she had infected several school girls and boys with gonorrhea. The Psychopathic Hospital found her to be an imbecile, but deportation at this time to one of the countries at war seems impractical and inhuman, and so she is being temporarily cared for in the Wrentham State School without commitment.

These ten instances are but a few of hundreds that might be cited to illustrate the stupendous task which social agencies assume to deal with while the feeble-minded remain in the community, and it is reasonable to assume that there are many instances which have never come to the attention of any social agency before they become the active factors in various kinds of human tragedies.

The various social agencies of Boston have for many years struggled, and are struggling today, with indifferent success, with the effects of feeble-mindedness. They realize that it is useless to grant aid to a family in which one or both of the parents are feeble-minded, for the money will be wasted, the children will be neglected, one or more of them will be likely to be delinquent, and the money that has maintained the home has only maintained a group that become an increasing burden for the future. The relief societies that are interested in making their resources count for good citizenship see resources that could be put to better use frittered away on families that add weakness rather than strength to the body politic.

The social and civic agencies that are interested in the development of better standards of labor and better rates of wages find the border-line feeble-minded in employments where they cannot earn a reasonable living, but where they are used at low rates of pay to do the more simple tasks. The children's aid societies find it necessary to use their funds, which should be available for the care of the promising children, to care for feeble-minded children, for whom the State is unable to provide in its institutions or for the uncommittable border-line feeble-minded that make slight response to the effort that is made in their behalf, or are so unreliable that they upset all reasonable plans that the community can make.

For the purpose of gathering together the successful as well as the unsuccessful experience of the various social agencies dealing with families in Boston, the League for Preventive Work was organized about two years ago, through which the twenty constituent agencies that provide for its support may pool their information and learn from each other and from the general experience of the community. Feeble-mindedness is one of the degenerative influences in the lives of families with which all of these agencies deal. It contributes weakness to any constructive plan that we may make. The League is a defensive alliance in case work, by means of which our various agencies may learn from each other's failures, and may contribute strength through a broader and more intelligent view of the whole situation. It is the expression of a constructive interest in feeble-mindedness on the part of the twenty agencies.

Social work has during the last ten years been increasingly harnessed to an exact evaluation of scientific facts. Any new discovery in science, whose bearing upon case work is recognized, is eagerly accepted. On the other hand, our social case work agencies have a more or less valuable body of material, dealing with thousands of families. Through the great specializations which have come into social work, the whole social experience of the community with the family is divided among different agencies. The League believes one of its functions to be the gathering together of reliable facts, in accessible form, of the community's experience, so that it may also contribute in increasing measure what it has learned. In this way we hope that the League may be of greater service than to the agencies themselves; that from its material there may come contributions in social science which no single agency is able to make.

A PLEA FOR THE INSTRUCTION AND AFTER-SCHOOL CARE OF THE FEEBLE-MINDED DEAF.*

By Caroline A. Yale, Northampton, Mass.,
Principal, Clarke School for the Deaf.

It may seem absurd to take the time of this body for the presentation of the needs of a small sub-group of that great class whose needs you are considering in so comprehensive a way, but surely a feeble-minded child is none the less so because he is also deaf.

A fact which neither time nor place alters was long ago stated in those oft-quoted words of the peasant preacher of Nazareth,—"For he that hath, to him shall be given; and he that hath not, from him shall be taken away even that which he hath." This is but the assertion that abundant harvest results only from abundant seed scattered; wealth produces wealth; power of body and mind are the invariable result of endowment well used; and, on the other hand, for the meagerly endowed, either in body or mind, that little which he has is lessened by disuse and abuse. No clearer illustration of this truth can be found than in the restrictions which the loss of one faculty imposes upon the remaining faculties. The deaf are not so much to be commiserated for their loss of all the sweet sounds of life as for the loss in mental development which comes from the failure of the stream of language to flow in through the open channel of the ear; and the less the original endowment of mind, the greater must be the hampering and dulling effect of the deafness. The causes which produce deafness are, many of them, also causes of feeble-mindedness, and these causes surely lower the general vitality of the child both physically and mentally; therefore the percentage of feeble-mindedness among the deaf will probably always be higher than among the hearing. These feeble-minded deaf children will be found grouped in several classes: (1) those who have been wholly neglected, being of too low mentality to gain admission to any school; (2) those who, having gained admission to a school for the deaf, are retained but a year or two and then begin a round of transfers from school to school, and at last are turned out fitted for nothing, quite incapable of self-support and more incapable of self-control—a menace to society; (3) those who have been transferred from the schools for the deaf to the institutions for the feeble-minded. It is not strange that these institutions hesitate to admit such children. Overcrowded as they are, they cannot be blamed for hesitating to assume such a special task as the instruction of those who, to their feeble-mindedness add deafness, and who, because of their lack of hearing, must receive instruction through the eye and not through the ear; (4) added to these, there is a considerable number of cases of the same sort, but slightly higher in grade, kept—under protest—in the schools for the deaf, because there is no other place provided for them. Every school for the deaf admits a percentage of pupils who suffer from two defects—neither, by itself, being so marked as to give decisive classification. These children are mentally of low grade and, in addition to that, their hearing is defective. They are often retained in the public schools until long after the age when they could be helped most by the work of the special school. At twelve or fourteen, they grow troublesome, and something has to be done; then they are relegated to the school for the deaf. There, in smaller classes and with more individual instruction, the exact status of the child is more definitely determined. Some respond well to this special training, but in not a few of these cases the defect is found to be largely mental. The principal of one of the schools in a neighboring state recently made this statement: "In my experience I have come in contact with only a few totally deaf children who could rightfully be classified as feeble-minded. On the other hand, there is a very large number of hard-of-hearing and border-line cases in our schools that class as mentally deficient."

All those reasons which are accepted as adequate justification for the separation of the hearing feeble-minded from the normally endowed are as applicable to these classes among the deaf. It is certain that in the schools for the deaf these doubly handicapped children are not receiving the sort of training their capacity and condition require. It is wrong to force them to spend the greater part of their time on the usual studies of a course suited to normally endowed deaf children. As the same able instructor, in speaking of this class of the deaf, has said, "The instruction should be based upon industrial work pursued through regular class-room activities, and not allowed to 'degenerate' into reading, writing and arithmetic." Neither should they be subjected to the constant depressing comparison of their own limited ability and meager acquirements with those of their more fortunate fellow students. For their own sake, they should not be retained in these schools.

It is equally important that these most unfortunate children be separated from the deaf children of average mental ability, for the sake of the larger and better endowed class. The boys and girls who, despite the handicap of deafness, are able to pursue the studies of the high school and college, or those who go from our special schools into independent self-support, assuming intelligently the duties of citizenship, should surely not, during any part of their training, be classed with the feeble-minded.

Dr. A. L. E. Crouter, of the Mount Airy

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* Read before the Conference on Feeble-mindedness of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Dec. 15, 1916.

School for the Deaf in Philadelphia, one of the leading authorities of the country on the subject of the instruction of the deaf, says: "In common with most teachers of the deaf of the present day, I am of the opinion that the presence of feeble-minded deaf children in a school for deaf children, otherwise normally endowed, is harmful and unwise. It is harmful in that it subjects normal deaf children to influences that are morally injurious, and materially interferes with their best mental development. The presence of such children impairs the usefulness of the school by exacting time that may more wisely and more profitably be expended on normal pupils. It interferes with the grading, it exhausts the nerve strength of teachers and caretakers, it robs the normal deaf child of time and training that are justly his, and in the end it does not pay for the time and labor expended. The two classes (the feeble-minded deaf and the normal deaf) are so dissimilar in their condition and needs, and in the object and results of their training, that it is obviously unwise to bring them together for purposes of training and instruction. In the care of the feeble-minded, a small proportion excepted (morons), their care and training are largely custodial, and, in my opinion, should always be made so for the protection of the community; in the case of the normal deaf it is wholly educational, having for its only purpose intelligent, law-abiding, self-supporting citizenship. In the Mount Airy School feeble-minded pupils are never knowingly admitted. If by chance any are received, as soon as their mental condition is discovered they are discharged. Pupils not feeble-minded but of low mentality are retained just so long as they manifest any improvement; they rarely remain the full period of ten years. I suppose that fully thirty pupils have been denied admission during the past five years on account of feeble-mindedness, and as many more discharged before the completion of the full period of training on account of low mentality and consequent inability to profit by the regular course of instruction." This school contains over five hundred pupils.

In two of the smaller European countries the attempt is made to base the education of the deaf on scientific classification. In Schleswig all deaf children enter a preparatory school, from which the brighter ones are removed to Grade A, as it is called—a school in another part of the city. Others are placed in Grade B school. After two years the dullest are transferred from this preparatory school to the C grade—a school for feeble-minded deaf children. In Denmark the procedure is practically the same.

In our own country no separate schools have been organized for deaf children of differing degrees of mentality, but in most, if not all, the schools there are classes of very dull pupils whose work is modified to fit their low grade of ability. In some schools, even distinctly feeble-minded children are retained. As stated previously, there are some excluded from all our schools either at the outset or after a fair trial, as incapable of profiting by the regular work of the school and as being a hindrance to the work of the brighter pupils and an influence not desirable morally.

The suggestion has been made, that if one school for the feeble-minded deaf were to be established in New England, it would be ample provision for the unfortunate of this class. That would, no doubt, be true, but it is necessary to keep in mind the after-school care of these same boys and girls who will need the closest supervision and custodial care to prevent the multiplication of their kind. This need of custodial care seems to indicate that the grouping of them with other custodial cases of the feeble-minded is the wiser course to pursue. Would not the establishment of a department in the new school to be opened at Belchertown seem a wise provision for the needs of this class?

Mr. Wheeler of the school in Hartford says, reporting for the last three years, "we have refused to admit three children who seemed feeble-minded. Eight have been dismissed,—two from Massachusetts,—and all of these children were of such low mentality that they were a menace to the others. We have no room for feeble-minded children, and teachers of the deaf should not be expected to teach the feeble-minded deaf in the same classes with normal deaf children. There are, no doubt, in New England quite a number of deaf children who could not be admitted to any school for the deaf. I wish that some arrangement could be made with one of the states to take all of these children and put them in a department by themselves under the care of a person who understands the deaf."

Mrs. Warner, principal of the Beverly School, says: "I would certainly urge that steps be taken for special provision for the feeble-minded deaf children of the state, either in a school for them or under a special teacher in a school for the feeble-minded already established. As the children grow older, the need of some place where they can live and not be a menace to the community is much more apparent."

Monsignor Splaine, in charge of the school at Randolph, says: "We are glad to hear that some effort is to be made to secure a better understanding of the feeble-minded deaf child. We are occasionally obliged to reject applications for the admission of such children to our school, as we do not think it wise or just to retain them in schools with normal deaf children. Sometimes we have given a child the benefit of a doubt and admitted him on trial, and have later found it necessary to discharge the child. In such cases, parents have said that they had great difficulty in securing admission to the existing schools for the feeble-minded. A special department in the school for the feeble-minded, or, better still, if the numbers warrant it, a special school for these sub-normal deaf children, similar to those now established in Europe, would seem to us the best method of caring for them."

Miss Jordan, of the Day-school for the Deaf in this city, and Miss Fuller, so long in charge of that school, express themselves as "glad that there is a possibility of giving to the deaf children of this state, who are mentally below the normal type, instruction suitable to their needs." They think "they should have a school entirely independent of other handicapped pupils and should have skilled, experienced, sympathetic teachers." They urge also that "the greatest possible care should be exercised in deciding about admissions to schools for these children," and "that only persons of experience with deaf children and skilled physicians should take the responsibility of deciding as to placing a child in such a school."

These are the opinions of those who are in charge of the schools in which the deaf children of this State are being trained. Is it not evident that the problem of our feeble-minded deaf is of sufficient importance to demand the thoughtful attention of those who are attempting to solve the great general problem of feeble-mindedness?

THE DEFECTIVE GIRL WHO IS IMMORAL.*

By Mabelle B. Blake, Boston,

General Secretary, Boston Society for the Care of Girls.

This paper deals with the high-grade defectives, those who to all appearances approach most nearly the normal type.

It is not a great many years that we have been able to recognize the most typical cases of this group. They approach too closely to the lowest types of the normal to be distinguished readily without more or less observation.

It is a group out of which may come the delinquents, the diseased, the unmarried mothers, and those with immoral proclivities, spreading disease and moral corruption.

Even in this day and generation a feeble-minded girl is often brought before a court and treated as a responsible person. She may, perhaps, be sent back to her home with an admonition to mend her ways. She may be put on probation or possibly committed to an industrial school. Whatever the decision, she fails to respond to treatment. If she goes back to the old environment, she soon falls a victim to the same influences that first brought her to the court. The community denounces her and says she is incorrigible. She, the poor unfortunate that she is, becomes a source of corruption and disease, and she bears children, one after another, who inherit her misfortune.

In a recent study made in a city in a nearby state of the problem of girl delinquency, out of a group of twenty-nine cases investigated, the following results were given. Of this number six were found to be subnormal. Three of the girls were found to be feeble-minded, two border normal, one unstable and neurotic, none able to care successfully for herself. In addition to the number examined, one other is known to be feeble-minded, one is in the incipient stages of insanity; six more give evidence of being decidedly subnormal, and would undoubtedly be found deficient if given the Binet test. Speaking as conservatively as possible, eight girls of the twenty-nine (27.5%) are known to be subnormal mentally. There are indications that the entire fourteen (48.3% of the whole) are subnormal; also associated with this mental debility is usually bad heredity of various sorts and a permanent lowering of moral tone through long contact with degrading environments.

Still going on with this study group, the report states that, with the exception of one girl who continued until she was fifteen years of age, all of the twenty-nine girls left school at the age of fourteen. The large majority show a retardation in their grades.

Never attended school	1
1st grade	1
3d grade	2
4th grade	3
5th grade	8
6th grade	6
7th grade	6
Unknown	2
	29

In studying a group of 196 children who had previously been under the care of the Boston Society for the Care of Girls, and who had been returned to parents and relatives, we found that, out of thirteen who were defective but not committable, four, after leaving our very careful supervision, gave birth to illegitimate children.

Fortunately, we have come to a realization that no amount of effort on these defective girls will bring about a desired development, because they do not have the faculties upon which to build.

Let me give you three cases of girls whom we have known intimately, each girl being a high grade defective.

Case 1. Sarah, a girl of fifteen, came to us before we realized the importance of a mental test at the outset. She came for protection of herself and her illegitimate baby, three weeks old. When Sarah's father had died, five years previous, in Nova Scotia, the mother came to Boston with Sarah and three younger children.

Sarah's history showed little development mentally. She was often promoted in school to make room for the next child, and because she seemed too old to remain in the lower grades. The father of

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* Read before the Conference on Feeble-mindedness of the Massachusetts Society for Mental Hygiene, Ford Hall, Boston, Dec. 14, 1916.

Sarah's baby had been frequently entertained in the home, and had also had wrong relations with the mother. The baby soon died, and it was our task to place the young mother. For the next year and one-half she was placed in four working homes. In each place she worked well, was a good housekeeper, but could not be trusted away from the family. She told glaring tales of immorality. She rummaged drawers, and would pilfer such small things as soap, writing paper, trinkets and things of no value. She soon became independent and saucy and showed an ungovernable temper. It was her capability at housework that made us slow to recognize her mental lack. When Sarah was given a mental examination she was at first considered doubtful, but later diagnosed as a moron. Then came four months of waiting before there was a vacancy at one of the schools for the feeble-minded. During this interval she grew steadily worse and, although supervised closely, she would get out of the house in the middle of the night and go with the first man whom she would meet perchance on the street. Each time she was penitent and begged to be given another chance.

In contrast to this restless, stubborn, unhappy, immoral girl in the community, her proclivities, over which she had no control, growing steadily worse, we now see, two years later, a young woman at the State School at Wrentham, happy and capable in her daily work, singing in the chorus, contented with her surroundings, and not wanting to come away, even for a short vacation. She is the same girl who came to us with her illegitimate child, and who was uncontrollable. She has no more mentality than the day she entered the school, but she has been under the care of those who know how to train the defective; she has been away from the temptations which she could never resist; she is happier than she has ever been before because we are not trying to develop her beyond her possibilities. The community is saved from her corrupting influence, and no more children will be brought into the world to suffer like consequences.

Case 2. Another case is that of a sixteen-year-old girl, who was referred because she had been away from her home for two days, and her family were frantic, not knowing where she had gone. When she was located the impression she made was that of a reticent and shy girl, which characteristics quickly changed to an irritating stubbornness as soon as she was not permitted to have her own way. She had romantic notions, and an impractical idea of men and their attentions to her. She was quick at scheming for the purpose of effecting her own plans, but was childish and unreasonably self-centered, having no consideration for the feelings of other people. She was deceitful and untruthful. She also exerted an unwholesome influence over other girls. She said very little, but complained that everybody "picked" on her.

Helen was diagnosed as defective and admitted to one of the State Schools. In one month, however, her parents insisted on her return to the home and she was released, only to go back to her old environment, where she is bound to be a menace. We must go a long way in educating the lawmakers, before laws will be enacted making it possible to retain patients, if the parents do not wish them held.

Case 3. Four years ago Mary, a girl of eighteen, was brought to our attention. Her foster parents, who had adopted her when she was a very little girl, found her to be uncontrollable, and they feared immorality would result. Investigation revealed the fact that the girl was illegitimate, and that her own mother was an immoral woman. She was one of one hundred children who were offered for adoption by a well-meaning society. The foster parents were well-educated people, able and anxious to give the girl the best opportunities. At the age of ten the girl was insolent, stubborn and more or less obdurate. At the age of fourteen she began to steal, was saucy and disagreeable, and showed much hatred towards her family. At the age of seventeen she had managed to reach the first year in high school, but truanted several days, going to moving pictures, and by writing clever notes managed to conceal this fact for nineteen days. She had already infatuated a young college man of promise. Physical examination showed her to be well developed. Mental examination proved her to be defective but not committable.

HISTORY WHILE UNDER THE CARE OF THE BOSTON SOCIETY FOR THE CARE OF GIRLS.

Mary was much interested in sewing, and was placed at board where she could attend trade school. She went to the school fifteen days, apparently liked the work very much. On the sixteenth day, however, she did not go to the school, and when it was discovered, she told a most graphic story as to how an intimate friend of hers had died. It was afterwards proved that the whole story was false. She had been spending her time at motion-picture houses with strange men. Mary, upon her own request, was placed in a private family, where she was to do the work of a seamstress. She remained here a little less than three months; although she had many interests within the family as well as many without, which were wholesome, she soon found objectionable associates and could not be trusted. She next took a position as chambermaid in a women's boarding house. She remained three months, was out until the early hours of the morning many times a week, and was discharged. Shortly after we first knew the girl she located her own mother, who, to all appearances, was still living an immoral life. After leaving the boarding house, Mary returned to her mother. It was at this time that every influence for good was taken away and the girl utterly collapsed morally.

Subsequent History. Shortly after returning home, Mary joined a cheap theatre troupe. It was later learned that she was living at a questionable hotel with the manager of the troupe, passing as his wife. When our agent appeared with an officer, she had left and could not be located. It was five months after this episode that Mary was found in an indescribable condition, in a nearby town, at the home of a relative, desperately ill with a gonorrheal infection. She refused medical aid. The matter was referred to the Board of Health, but before they could act she had again disappeared. Another five months elapsed, when a letter came to the office from Mary, stating that she was married. It was afterwards learned that Mary was five months' pregnant when she married the man who was not the father of her child. She lived with her husband but a short time, and when the baby was a year and a half old was reported to the Society for the Prevention of Cruelty to Children because of the neglect of her child. Mary was drinking and smoking, and probably a drug-user. At this time another mental examination was suggested, there having been three since the first. When the doctor went to see the mother and child, again they had disappeared. This was nine months ago, and up to the present time they have not been located. We shudder to think of the probable evil she is spreading, for one such person can corrupt a whole community.

To summarize—these cases give us sufficient evidence of the obvious results when the defective girl who is immoral is in the community, and we will all agree that often the evil done is not that which can be seen.

These defectives lie and steal, spread disease and moral evil. They give birth to children, whether legitimate or illegitimate, who are apt to be feeble-minded or degenerate. These unfortunates, who are not responsible and are easily led, we are allowing to be a prey to any evil influence.

This would be a dark picture, indeed, were it not for the fact that there is a general awakening to the knowledge that there is a problem of feeble-mindedness. We recognize the necessity of detecting subnormals at an early age and training them accordingly, perhaps in their own homes, until adolescence, and then in a custodial institution. As Dr. Fernald has stated, we are now talking about the best way for protection, education, supervision and segregation of the feeble-minded—a plan that will be for economy, safety and welfare. Schools have established special classes for the backward child, that those of subnormal mentality may be detected at an early age; child-helping agencies are making a threefold diagnosis of their children—social, physical and mental—and some are employing their own psychologists. Still further, agencies have joined together for one common purpose, out of which has been formed a League for Preventive Work, which is now helping by studying feeble-mindedness. By means of concerted action, legislators are realizing the importance of custodial care for the defective, and that in the state schools they may be made happy and, to a certain extent, self-supporting. We have a long way yet to go. We are at least approaching the time when the State will save money, otherwise expended on useless reformatory care and future court trials; when the community will be saved from the spread of diseases, and when the propagation of the feeble-minded will be prevented.

Book Reviews.

Pharmacology and Therapeutics for Students and Practitioners of Medicine. By Horatio C. Wood, Jr., M.D., Professor of Pharmacology and Therapeutics in the University of Pennsylvania; Second Vice-Chairman of the Committee of Revision of the U. S. Pharmacopeia. Second edition. Philadelphia and London: J. B. Lippincott Company.

The second edition of this valuable work within four years shows the appreciation of the medical profession, which is unquestionably grounded upon its excellence. One of its chief merits is that it has been modified to meet the changes of the United States Pharmacopeia. The author also shows his independence by including remedies which have proved their value to him though not recognized as official by the previous authority mentioned.

The scheme of the work includes, in the first chapter, preliminary considerations, with reference to weights and measures, where, as in other works, an effort is made to unite the old with the new; prescription writing, in which allegiance to the newer method of simplicity has been fully considered; and incompatibles, where general principles are considered rather than a series of drugs which may not be combined with a series of others, thus simplifying this important feature of pharmacology and placing a smaller burden on the memory.

For the remainder of the work, drugs are conveniently classified under their general activity rather than their adaptation to different diseases. For instance, they are grouped under drugs to effect secretion, the nervous system, circulation, alimentary tract, metabolic processes and the causes of disease. This, unquestionably, is the only rational way in which to impress upon physicians the activity of drugs and their intelligent employment. One can but approve the recommendation of cannabis indica as a means of combating pain, particularly, since the campaign by the Government against the indiscriminate use of opiates and cocaine.

An excellent bibliography accompanies every group by which those who desire further information may readily learn where it is to be found. Unfortunately, guided by the Pharmacopeia, the author is compelled to discuss the various preparations of certain well-known metals like iron, arsenic and mercury, whose multiplicity tends to anything but simplicity in the use of drugs. The employment of creasote to stimulate gastric motility, which has been urged by many authors, is not mentioned, although its antiseptic activity in the digestive tract is fully considered. The author's views in regard to the uselessness of the employment of pepsin and pancreatin are fully justified by late experimental investigations.

A final chapter on drugs of minor importance is included, with the biting criticism that they are still retained by the Pharmacopeia out of respect for the practices of the ancients.

On the whole, this work must meet our ideal as a guide both for students and physicians in acquiring a working knowledge of this most troublesome of all branches of modern medicine.

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PHYSICAL SIGNS OF INCIPIENT TUBERCULOSIS.

THE advance in the laboratory methods or aids in the diagnosis of tuberculosis have aided, rather than established, the diagnosis of this disease. In the incipient stages, dependence must still be had on physical signs elicited from the infected organs—the lungs or allied organs, especially the heart. The heart responds objectively more quickly to tubercular infection of the lungs than even the lungs themselves. In health, for example, the aortic second sound is louder than the pulmonic second. In the incipient stage of tuberculosis the conditions are reversed,—the pulmonic second sound is louder than the aortic. While this reversal can be found also in mitral insufficiency and in mitral stenosis, these conditions can easily be ruled out, and then the accentuation of the pulmonic second sound remains almost pathognomic for incipient pulmonary tuberculosis. Besides, the pulse is always found accelerated at some period of the day or after some activity. Abrahams noticed that in about 80% of his cases of early tuberculosis, the pulse was obliterated on the affected side when the arm was raised above the head. This condition was not found in advanced cases.

Inspection of the chest wall anteriorly reveals the fact that normally the right apex expands more than the left, and if the expansion of both sides is equal, suspicion may be directed toward the right apex. But actual retractions of the supra- or infraclavicular spaces is a sign of advanced disease, and not of incipient. In any event, however, it is unilateral retraction that is significant because bilateral incipient pulmonary tuberculosis is rather rare. The same relative significance must be accorded to fremitus. Fremitus in the right apex is normally better than in the left; equality points to disease in the left apex.

The significance of the percussion sounds is not absolute. It varies according to location. In certain parts dulness may be as normal as resonance in other parts. But in determining the kind of resonance, it is pitch and duration that count, but particularly the latter. Long duration means resonance, short duration means infiltration, while no duration means consolidation. But vesicular resonance is found normally below the left clavicle, below the second right interspace, in the axillary spaces, and over the lower ribs. Dulness is normal over the right apex, in the second right interspace—especially the outer half, the intrascapular space, between the seventh cervical and the fourth or fifth dorsal vertebrae, and over the deep area of the heart. Flatness is normal over the scapulae and the superficial areas of the heart. If, then, the left apex is as dull as the right, there is infiltration of the left; and infiltration of the right apex ought to give a dull-flat (Abrahams) sound. The crucial test of apical non-infiltration is the change from the dulness to vesicular resonance on deep inspiration. If there is infiltration, there will be no such change.

Normal auscultatory—vesicular—sounds are found in the left apex and below the left clavicle down to the base of the heart, in the axillary regions, over the lower lobes, and below the right clavicle. Broncho-vesicular breathing is heard over the right apex, in the second interspace close to the sternum, and in the intrascapular space. Broncho-vesicular breathing follows the lines of normal dulness. Bronchial breathing is not found over normal lung tissue; it is heard over trachea and larynx, and may be used for comparison. Vesicular breathing has a long inspiratory murmur and a short expiratory. In broncho-vesicular there is an equal length of both, but the pitch is higher. Tubular or bronchial breathing is characterized by very long expiratory murmur and high pitch, but, of course, this form of breathing is not to be found in incipient tuberculosis. The changes from normal to pathological lung by auscultation are progressive—from vesicular to broncho-vesicular to tubular. In the left apex the normal vesicular changes to broncho-vesicular, but in the right apex the prolonged expiratory murmur denotes advanced process. The spoken and whispered voices are more distinct as the cases progress away from vesicular breathing.

These masses of signs are mere guides. They must be marshalled and interpreted. It is the interpretation of the signs found on examination, perhaps much more than the mere discovery of them by the senses of an able examiner, that helps make the proper diagnosis. In tuberculosis it is proper diagnosis that saves life. It is a therapeutic measure of first importance, whether for the individual himself, for any unit of which he may be a member, or for society at large.

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MEDICAL NOTES.

Government Surgeon at Columbia, S. C.—Surgeon French Simpson, U. S. Public Health Service, has been sent to Columbia, S.C., to take charge of the campaign against malaria.

WAR NOTES.

War Relief Funds.—On Sept. 30 the totals of the principal New England war relief funds reached the following amounts:

Armenian Fund	$232,375.74
Serbian Fund	124,207.42
Surgical Dressings Fund	123,445.85
French Orphanage Fund	121,976.06
Polish Fund	85,985.73
Metropolitan Red Cross Fund	80,673.34

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending September 22, 1917, the number of deaths reported was 248, against 229 last year, with a rate of 16.74, against 15.70 last year. There were 44 deaths under one year of age, against 51 last year.

The number of cases of principal reportable diseases were: diphtheria, 72; scarlet fever, 15; measles, 22; whooping cough, 29; typhoid fever, 7; tuberculosis, 56.

Included in the above were the following cases of non-residents: diphtheria, 6; scarlet fever, 4; measles, 4; whooping cough, 1; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 2; measles, 2; whooping cough, 5; tuberculosis, 22.

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The Massachusetts Medical Society.

NOTES TAKEN AT A HEARING BEFORE THE SPECIAL COMMISSION ON SOCIAL INSURANCE AT THE STATE HOUSE, BOSTON, SEPTEMBER 19, 1917.

Chairman: We have set the hearing this morning to hear from the employers of labor on the subject of social insurance. If there are any persons present who care to be heard at this time, the Commission will be glad to hear them.

Mr. Edward B. Saunders of the Simonds Mfg. Co. of Fitchburg, and today representing also the Associated Industries of Massachusetts, an organization numbering over 250 large employers of labor in the State of Massachusetts: I might say by way of introduction that in connection with that association it is my work to maintain a service bureau and accumulate information on social insurance. I am also a member of the National Association of Manufacturers.

Last year we interested ourselves very actively in the subject of social insurance, and at that time many aggressive moves were made to try to get some states, and particularly Massachusetts, to adopt it as part of their programme. This year the business of the war seems to have rather crowded this subject, with many others, into a subordinate place, so that I have not kept quite so close to it as in the years past.

To interpret the mind of the employer is perhaps not easy, because different employers are of different minds; and yet I think it is fair to state, in lieu of the welfare work done in many of our industries, that the employer is friendly to any reasonable proposition which he feels will benefit his employees; and, as an instance, I would cite the welfare work being done, particularly in the aid and benefit societies that are fostered in particular industries, and the newer forms of group insurance that are being taken up here and there and promise to become important in all our larger industries. The general attitude of the employer toward his help is to make the working conditions and social conditions of the factories conducive to the best life of the working people. Take that as a general proposition. As to the particular proposition of health insurance which, we are told, is the next step in social insurance: Those who advocate it have a programme: the first step was workmen's compensation, which has been carried; and while there are those who questioned whether that properly belongs to the social insurance group, they are inclined to think it does. The next step is health insurance; then will follow various types of unemployment, invalidism, maternity and new conditions to be added from time to time.

We feel on the matter of health insurance that it is something that requires more study. We have very little experience, and such as we have is mainly foreign experience, and from such figures as the fraternal insurance societies and benefit aid societies are able to give us, and, considering that the workmen's compensation insurance, which has been in operation for some years, is not yet fixed but that changes are being made in it continually, it can readily be seen that our experience in health insurance (which is very much less) hardly justifies us to take a new venture until what we have already has assumed more settled conditions. The workmen's compensation insurance is subject to amendment continually. During this present session, the employee was permitted to have his own physician, and the benefits were advanced from $10 to $14 a week, and therefore the rates must go up some 20% or more. We have gotten into a system of merit rating, which is a distinct advantage, but all the time we are trying to work out somehow the compensation problem for industrial accidents, and in this state it includes occupational diseases. The transition from occupational diseases to general health insurance does not seem to be a very long step, but yet when it is considered that our experience in occupational diseases is still in a very doubtful condition, it does not seem wise to move on to the next step of the programme until the first step has been more completely worked out.

The scheme for health insurance is to cover the workman and perhaps the entire community; it calls for a panel of physicians. During these war times the physicians are the men who are the most difficult to reach for work of this kind. Many of them are being taken abroad, and I understand that the more talented among the doctors are the ones taken over; this applies more to the doctors than to any other class in the struggle. It consequently looks as though there would be a dearth of physicians in this country. There is a great deal of splendid work being done in the way of research as to the causes and cures of occupational diseases. Our own state hospital is doing some splendid work, and when the representatives of various state commissions went out to that hospital, they were greatly impressed by what they saw. But whatever is being done only shows us how much remains to be done. A measure which calls for a large outlay of money and the services of physicians at a time when both are increasingly difficult to obtain, seems altogether premature. We ought to have experience to know how to handle any insurance matter, and the complications that have grown out of the workmen's compensation have almost all come through lack of experience. With health insurance we have very much less experience and, therefore, the employer feels that we ought to tread softly and be sure we have just the right plan before we try to put it in operation on any large scale. He is very friendly to any research work, etc., but he thinks that before the State really takes decisive action, we ought to be certain that this is the thing to do.

The private insurance companies are helping to accumulate an experience, but not enough as yet to justify us in adopting this as a wholesale measure in our State.

The chief criticism that I have heard made against health insurance is that it is on paper. The men advocating it are all men whose intentions are the very best. They sincerely desire to help the working people and the community, but theirs are theories without very much support as yet from the facts, and so we ask that we may go on gathering such experience as is possible, and wait until these experiments justify the adoption of some larger programme, if that day ever comes; for there are a good many who doubt whether the State ought to go into the insurance business; whether it is not something for private enterprise rather than a State measure. There are a good many who question whether too much power ought to be centralized in the State. The experience of the war offsets the experience of insurance there.

Certainly at this time, when we all are making sacrifices and forgetting our selfish interests as far as possible to give ourselves to the Government, we ought not to have this increased tax for putting forward a plan which means a large expenditure with no guarantee that it will accomplish what is proposed.

That covers, in general, what seems to be the attitude of the employers towards this question.

Chairman: How many of these 250 employers you represent maintain now a system of mutual benefit association in their concerns?

Ans.: I am not able to give exact figures, but very many of them do. The Simonds Mfg. Co. has an aid and benefit association in which the majority of the employees are enrolled. They get sick benefits, a small death benefit, and they can borrow sums of money from this fund to tide them over financial stress. We employ a nurse and a doctor whose services are free to them. Our plant is typical of a number.

Some of the Western industries are more advanced than our Eastern ones, but many of the companies here have large hospitals, etc. For example, the Fore River Ship Building Co. examine their employees to help them (not to reject them); they have emergency rooms and hospitals; everything to foster the health of the employees.

It ought to be said that the employer recognizes that health is a very essential part of the efficiency movement. I wish to emphasize that. People who have efficiency matters in charge, look closely to the health of the workers.

Mr. Greenwood: Does your firm in Fitchburg contribute to this benefit association?

Ans.: We contribute 20%. We try to make it as self-supporting as possible, but in order to bring the rates down where we want to have them, the firm puts that money in.

Mr. Greenwood: Would it be possible to find out how much welfare work is being done by your association? That and group insurance? How extensive is it among the members of your association?

Ans.: Group insurance covers members of the whole plant. It is comparatively new.

Mr. Greenwood: What about the merit system you spoke of?

Ans.: The merit system is something which has been fairly well worked out with the Rating and Inspection Board, with the permission of the Insurance Commission. It provides that a firm doing certain safety work and welfare work is entitled to credits. A firm which has a safety committee will get a credit of 6%. For every measure that the employer takes to prevent accidents, he gets a credit. It has been coming about rather gradually, but now is the accepted policy of the insurance companies, all of which belong to this Rating and Prevention Board.

The employment of a nurse counts as a credit and tends to reduce the insurance premium.

Chairman: How much do the men have to pay?
Ans.: It is a graduated scale according to how much the man receives. A man who received $15 a week has to pay 90 cents a month. Fifteen dollars is the largest benefit we pay. [The firm has a welfare book.]

Mr. Washburn: What is the Associated Industries of Massachusetts.
Ans.: It is an organization of employers. It is for constructive rather than defensive work. I would like to have that point made very clear. We are not an organization to fight anything, but to study ways and means to improve the industries and to secure the personal and active coöperation of the employers themselves. We have no paid attorney or counsel. We have an office in the Kimball Building. There are two lawyers there but they are not employed as lawyers; one is the general manager, and the other the secretary. Their functions are not legal but executive.

Mr. Washburn: Do you anticipate taking any action in the way of watching legislation in the next legislature?
Ans.: We shall certainly try to keep track of what legislation will affect the employer.

Mr. Washburn: Did you appear before this Commission last year?
Ans.: I consulted with Mr. Wright and I appeared before several other commissions, but I think not before this one. I centered most of my efforts on the Workmen's Compensation Act. [His views now are practically the same as when he appeared before the legislative committees, but feels very strongly that the war ought to make us cautious about entering any expensive legislation.]

Mr. Washburn: Don't you think the manufacturer can stand for more study of this proposition than the needy employee?
Ans.: I do not. The manufacturer is more likely to study the question, or delegate some one to study it for him. The needy employee is not so needy as last year because any one can find employment if he has any health whatever. If he stands on the street corner somebody will try to hire him. Last year it was not so easy to find work.

Mr. Washburn: You say that your organization is a constructive organization, and yet you haven't given us a helpful suggestion in drawing up a bill.
Ans.: I have tried to show that constructive work is being done by the employers and, therefore, a legislative bill is premature at this time. There wasn't a bill last year that was acceptable to all concerned. The one bill that was pushed the hardest was that the employee should pay two-fifths, the employers two-fifths and the State one-fifth. Those who speak for organized labor do not want to contribute two-fifths.

Mr. Greenwood: Would your association protest against the State paying it all?
Ans.: I think the association would feel that the State is not ready to go into the insurance business. We have not a State fund and the insurance company who was to handle it for the State has changed its name and become an entirely private company. That is as near a guide as anything we have to health insurance.

Mr. Brogna: When was the Associated Industries organized?
Ans.: It is only about two years old.

Mr. Brogna: Can you point to any of the amendments passed which were endorsed and supported by this association?
Ans.: We have endorsed a number that were not passed. I think that this fall I shall attempt to initiate one on self-insurance because the large companies feel that they can do their insurance better and cheaper than they can farm it out to others. We have not opposed with any strong opposition the amendments that have been passed. For instance, we were willing the employee should have his own physician; and we didn't oppose the increase in any organized way. We have appeared not in opposition so much as in explanation, as I am doing this morning. The employer feels that both sides ought to be considered.

Mr. Brogna: The argument was that the Massachusetts industries could not stand the increase if increased from ten dollars to fifteen dollars—that the rates would jump and be prohibitive.
Ans.: They have jumped, on account of this increase in benefits; it was proposed to jump the rates some 40%; they went up according to scale. The merit rating is helping to alleviate this just a little. At the same time, there are a great many employers who feel that the rates are getting so high that they better not elect to come under the law at all. This was seriously considered last year. I don't like to have it called opposition, but if we didn't come and state our views, you might ask us later, "Well, why didn't you come before us when we were studying the subject?" I am not opposing health insurance now in any antagonistic way. If the mass wants to saddle itself with that expense—from $2,000,000 up—and feels that the time is right, I suppose the employers will try to get along as they have under the other increases, but the bill will enter into the high cost of living.

Mr. Brogna: How long do you suppose it will take the manufacturers of Massachusetts to gather a sufficient experience at the rate they are going now so that we shall know whether we should adopt some insurance or forget it? What are they doing systematically? Unless something systematic is being done, how are we to find out whether we should have insurance unless we do make a bill?
Ans.: In a few days I could get a list of the employers who are doing this kind of welfare work; I intend to compile one, but it takes time to find out. You can't find out by correspondence; you have to depend upon personal visitations to see what is being done in these various industries.

Mr. Greenwood: It is very important to get that information as far as you can, and how it is operating. You say that, because of lack of evidence, your association feels that it is not time to put a wholesale scheme into operation.
Ans.: I haven't called for a formal expression of opinion.

Mr. Greenwood: Oughtn't you to get as far as possible some sort of a definite feeling along that line so you could give us a fair statement of how your organization feels?

Ans.: I could send out a questionnaire, but my experience is that they don't always give you what you want. They often fail to answer the most important part of it.

Mr. Greenwood: We can imagine that they are not looking for increased expense unless it can be shown to them that there is a benefit to them in it. That is a fair proposition. He wants some benefit if he is to have an increased expense.

Ans.: It is only within a recent period that manufacturing plants have been willing to give information about what they are doing. Now they seem to respond very readily, and I think if we had sufficient time we could get quite a little of their individual experience together.

Chairman: If I understood you correctly, you said that the experience in some foreign countries did not bear out the experience since the war. Did you refer to any particular country or were you taking the proposition in general?

Ans.: I was taking it in general and Germany in particular, where it was cited that everything was perfection along these lines; but now it seems to be evident that it was an effort to get a centralized power and better soldiery, and perhaps to soothe certain social democrats, who in that country would seem likely to revolt at any time. It was sort of a sop thrown to those who might want to change the form of government.

[Mr. Saunders was told they would not need the information desired until the middle of November.]

Mr. A. Leve, President of the New England Waist Co.: I was asked to come here and I might state that I am in favor of some form of insurance. While we don't employ thousands of hands, we employ quite a few, but that doesn't influence me. I have worked myself, and the tendency of any working man or woman is not to go to see a doctor until it is too late, and the reason is that the charges are too high and they don't want to pay the money; and when they go, they generally go to the cheapest doctor they can find. I will just tell you of one case: A man had been going to a doctor for months; the doctor said he had diabetes. I have studied a little myself, and I said, "You haven't diabetes. What have you been paying?" He said he had paid a dollar a week; had been to see the doctor once a week. I said, "You go to the Massachusetts General Hospital and be examined." Knowing the man, I sent another man with him, and the report came back that he had no diabetes but simply falling of the arches. That's one of many cases.

My experience in health insurance is that the employers are against it, the workingman is against it, and the doctors are against it. After it has been established, they are all in favor and satisfied. It is so with all new things. I don't suppose you gentlemen want to go into it helter-skelter, but the sooner we have it, the better the state of Massachusetts will be. Health insurance benefits not only the workingman but the whole community. It is a sort of preventive of disease if handled properly. What the workingman wants is a chance to go to the best physicians without having to worry that it will cost more than he can earn.

Mr. Greenwood: Who do you think ought to pay the bill?

Ans.: I would be willing to stand one-third, the workingman one-third, and the State one-third.

Mr. Greenwood: Do you think the workingman will stand for it?

Ans.: At first he will object.

Mr. Greenwood: What chance has it if we make a bill and the workingmen, the doctors and the employers are against us?

Ans.: You can say that in every country they have had the same experience, but after the law has been introduced the workingman has liked it. You hear that the doctors would lose money, but they would make more money. They could give their services for a lower fee because they would have more patients.

Mr. Greenwood: Has it prolonged life?

Ans.: That I can't say, but the records say,—and I know it is a fact, for I have worked side by side with these people,—that after they knew they could go to the best physicians in town, they went immediately when they weren't feeling right, and in most of the cases the doctor could prevent serious illness. You would have to guard against those who said they didn't feel well and stayed at home in order to draw half pay.

Chairman: Do you believe in a compulsory form? If so, compulsory on whom?

Ans.: You might have to make it compulsory on some, but is that constitutional? I am not a lawyer and do not know. I don't see any objection to it; I would be willing to abide by it.

Senator Brown: Where is your industry located? etc.

Ans.: In Revere. We have no system of mutual benefits. We employ about 50 men and perhaps 75 women, and have been in business quite a few years.

Commission: Do you belong to the Associated Industries of Massachusetts?

Ans.: I do not; have not considered joining it.

Mr. Collins: If you couldn't get the whole thing at one time, do you think a preventive system would be the first thing to try; that is, a physical examination by competent doctors?

Ans.: Anything to make a start is better than nothing because it will help the workingman and woman as a whole.

Mr. Collins: Do you think they would take kindly to a physical examination?

Ans.: No, I don't think so. It has been the experience in the past that they were against it at first, but after it had been introduced, they would not go back to the old conditions; and I have intimate experience with the conditions in Italy, France and Germany, and I know they all want it and like it there. Only in recent years has it been introduced into England. Lloyd George introduced it two or three years ago and it has had to go through its infantile diseases and trouble like any other country.

Senator Washburn: What kind of pay do the men get who work for you?

Ans.: They are all common laboring men, lumpers; unskilled labor, largely, and men who are not too much educated.

Chairman: What percentage is sick in a month now?

Ans.: I couldn't figure it out. If one gets sick I send him to the Massachusetts General Hospital and have him examined by good doctors. They are in favor of going to a good man. At the Massachusetts General Hospital they get as fine treatment as anywhere. There are a good many doctors who don't make too much, and if they get hold of a man they will hold him as long as possible.

Senator Washburn: Do you think it tends toward health or disability to bring the community into close communion with the medical fraternity? Don't you think it is disadvantageous to get a man to lean on a doctor?

Ans.: It will work itself out because they will get too much to do and will send the man away.

Mr. Greenwood: Are your men largely married?

Ans.: Yes.

Mr. Greenwood: Number of children?

Ans.: Yes, chances are.

Mr. Greenwood: Are they receiving compensation enough now so that if this extra expense were put on them it would seriously affect them?

Ans.: No, I don't think it would matter much. Every one has doctors' expenses now that would amount to more than he would have to pay toward insurance.

Senator Brown: When your men are sick, do you rush them to the Massachusetts General Hospital or to a private physician?

Ans.: We have a private physician who is called immediately, but we have a sort of understanding with him that if a case is beyond him, we want him to say so and we send the man to the hospital.

Senator Brown: You send lots of cases to the Massachusetts General? They don't make any charge, do they?

Ans.: They don't make any charge for workingmen as far as I know.

Mr. Greenwood: If the manufacturers should go into the proposition pretty generally, where would the Massachusetts General Hospital be? You would have to establish hospitals and infirmaries all over the state.

Ans.: That would be the best investment any state ever made.

Mr. Greenwood: We should need to make these so people could go at a reasonable expense. You send your men as a starter.

Ans.: That will come in its course automatically. To start that way would be something like turning the handle around. We have plenty of physicians that could be nominated as consulting physicians at a nominal charge to the insurance companies, and as the matter develops, no doubt the health insurance company or the state would be forced to establish infirmaries, if not established already.

Senator Washburn: What do you think of a form of insurance that would be compulsory on the state and on the employer but voluntary on the employee?

Ans.: It won't work.

Senator Washburn: What would you say to the legislative proposition?

Ans.: There is never anything worth while started and pushed without having some Waterloos to it. If it is worth while to start it, it is worth while to push it. It may not succeed the first time, but I firmly believe that if we don't introduce it early the other states will do it and we shall follow in the long run.

Mr. Greenwood: You have been in Germany? Mr. Gerard says the workers in the cities are hard workers and work longer and get less out of life than any other workers in the world. The laws that were supposed to benefit them bind them as closely to the soil as were the serfs in the times of feudalism. How do you reconcile that with your statement that it was a success in Germany?

Ans.: He probably knows more about it than I do. I want the workingman to be benefited and have the same chances to see the best physicians that the other people do.

Mr. Leve's company has no physician in its employ as it would not pay. They do not require physical examination.

Rep. Emery: Organized labor is opposed to physical examination?

Ans.: I would be opposed myself if I were a workingman. It is delving a little too far into a man's private life. I don't think it would be necessary in adopting public health insurance.

Mr. E. W. Burnstead of the Massachusetts Civic Alliance, which is composed of private citizens throughout the state: I represent an organization that has been represented by its officers here in the State House a good many times on various matters that our directors felt affected the public welfare, and it is from that position that I wish to address you this morning. I might also say that I have received this week from New York a resolution that was passed by the New York Chamber of Commerce this last February, which I should like to present to your organization. That resolution was against health insurance bill No. 69 which was presented in the New York Legislature this year and is substantially like the bill which was presented in this Legislature.

I should like to address my remarks to the injustice of compulsory state contributory health insurance. In order to learn about this subject, we have to go outside the United States. We have to go to the nine countries of Europe which have adopted it, but we meet certain difficulties. For example, the only country that has the system of state compulsory insurance is a country that has had it only three and a half years, and three of those years have been abnormal years, so we do not have very much to lean on in that country. In the Balkan States it is on paper only. Russia is in the throes of a revolution and we cannot get inspiration there. And Germany does not have a contributory system of the state; so we do not have a very good basis to go on. To do the best we can with such evidence as is available, I think you will agree with me that compulsory insurance by the State is very much like compulsory taxation by the State. Take, for instance, in Germany. In the course of these years $110,000,000 have been spent by Germany in sanatoria, hospitals, convalescent homes, etc. Others have been built by direct taxation. These have not had a mark put in by direct taxation, but from the employers of labor three-fifths, and the poor employees to the extent of two-fifths. There was a little from voluntarily insured people earning up to $900. Most of the money to build these institutions came from the workmen —and the poorest kind of workmen— and from the servants, who are not really in the class of workmen. And the workmen have received an average of about $1.50 a day in return. I think compulsory insurance of that sort is very much like taxation, and taxing the very poorest of the people. It ought to be done, but on a general tax levy. It is the outcome of what is called state socialism in Germany. Bismarck promised the democrats something in the way of social insurance and spent ten years in evolving this magnificent scheme, and when he got it done, they had what they called "state socialism." It is described in a book on the policy of Bismarck as "increased interference of the State in the private affairs of the individual." It goes a step further than compulsory schooling. As Bismarck saw, it relieved the State of the cost of building these institutions and the millions released were used to build up imperialism, and he saw the gradual making of a better and stronger army. Free America ought not to adopt a system that has such an autocracy for its parent.

As to England, where it was introduced by Lloyd George only a few years ago, Dr. William A. Brand makes the charge that when the National Insurance Act was adopted it was assumed rather than proved that it was for the benefit of the working classes. There was no adequate inquiry as to the effects national insurance had accomplished in other countries; if there had been, they would have been less sanguine. Dr. Brand says: "And the mere fact that Germany has national insurance was apparently considered sufficient reason for us to follow."

One injustice of this scheme is that it is presented by an organization in New York, which has a committee on social insurance, and not one member of that New York social insurance committee is a workingman; further, there is not an employer on that committee, nor is there an attorney working for the business interests. How can a committee so made up of academic minds make laws that will put millions of dollars into business and take it from the pay envelopes of the workingmen, and do it fairly and justly?

There is another injustice. It is unjust to employers to be required to pay bills which are caused by lack of care on the part of employees, resulting in bad housing conditions or excursions into various kinds of folly which they have a right to enter upon. Is it just to make the employer pay because of sickness resulting from such causes? Is it just to make the decent worker likewise pay for the sickness of such a worker at his side? And is it right to make the State pay for a class?

The New York Commission went into the subject thoroughly and have compiled the best book on it to date.

Another important matter is that it has never been put on people who had a written constitution. Lloyd George had no bill of rights standing in his way when he imported it from Germany, and I think today he would change his mind. Bismarck had no such constitution as that now being amended in this state, to block him. Should we surrender these rights of our citizens— the right to be secure in his own income and to do the best for his home and family? President Harrison said that "America exceeds other nations because it is a nation of homes." One of the most beautiful features of our home life in New England is the family physician, selected by the family, paid by the head of the family, and with the confidence of all in the home; his coming and going has been as beautiful a part of the home life as that of the pastor. I am told that in England the National Insurance Act has practically driven the practising family physician out of practice, and that, I call to your attention, is a very serious thing.

Will it be better to have forced examinations? Will it improve morals? Will it be better to have bribery and corruption, which we are told occur in Germany?

There are 33,000,000 wage-earners in the United States and the cost of this elaborate system would be enormous, and it would not be a decreasing cost. In Austria in 1890 the cost per year for each member was $2.00; it has risen to $4.67—an increase of 76% in caring for each member. In Germany the cost has been a rising one (24%).

There is another thing that should be taken in forethought in this matter. It is very important to have improvements going on in the way of prevention. Are we going to have these encouraged? They are a burden on taxpayers. If you are going to start this plan by an immense taxation you will discourage improvements that have for their object the prevention of disease and improvement of health.

It is essential to keep the government as simple as possible—the simplest is the best. This will put the expense of various bureaus, clerks, commissioners and inspectors onto the government. Dr. Frederick Friedburg spent twenty years in the Imperial Insurance office, and he draws attention to this fact. Pause and think twice before the state takes on a compulsory payroll.

Finally, with all the boasting regarding this scheme, it is not doing as much in Europe for the people as our people are doing here in the parks, playgrounds, etc., all costing millions of dollars; and all contribute more to the relief of the masses than health insurance ever could contribute, according to the views of its advocates. The reason is that it does not do what it claims to do. It has been a disappointment to the well-wishers of humanity. Of 100 persons insured in 1891, 35 were sick; in 1901, it had risen to 38; and in 1911, to 43—a continual increase in sickness of insured people of Germany.* The average number of days lost is important. Increasing from 5.89 days lost in 1885, to 8.49 days lost in 1912. Again, the average length of disability increased from 16 days to 19 days in Germany. So that we see the entire scheme is hopeless from the evidence that can be obtained.

To sum up and remind you of the various points: It is unjust to taxpayers, to employees and to employers; it invades the sacred rights of the individual; it leads to corruption of the medical profession; it would cumber our democracy with bureaucracies; it will tend to increase the payroll; will increase sickness days, and all this where we have trade unions, etc., without number—more than in any other land on the face of the globe—leaving practically none of our industrial workers in need of insurance against sickness.

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* From page 54 of the New York pamphlet on Health Insurance published by the Chamber of Commerce.

Sen. Brown: You are against health insurance because it would tend to increase taxes?

Ans.: I am against health insurance for the reason stated, and because it does not begin at the right end—prevention is better than cure.

Mr. Greenwood: You would be in favor of a preventive proposition to a certain extent perhaps?

Ans.: I think that is the constructive view to take. I think anything you can do to develop ambition and energy along that line will be valuable.

The Chamber of Commerce of New York has another clause: Resolved: That this Chamber favors the creation of a commission, to include representatives of capital and labor, physicians, economists, lawyers, actuaries, social workers, etc. The duties shall be to investigate the condition of employees in the various trades, the living wage, conditions under which they live, etc., to ascertain what the cost may be if divided equally between the employer and employee, and what the cost to the state will be if it assumes the entire expense of supervision and administration.

NOTES FROM THE DISTRICT SOCIETIES.

District Correspondents.

Berkshire, **A. P. Merrill, M.D., Pittsfield.**
Bristol North, **Arthur R. Crandell, M.D., Taunton.**
Bristol South, **Edwin D. Gardner, M.D., New Bedford.**
Essex North, **T. N. Stone, M.D., Haverhill.**
Essex South, **H. P. Bennett, M.D., Lynn.**
Hampden, **Laurence D. Chapin, M.D., Springfield.**
Hampshire, **E. E. Thomas, M.D., Northampton.**

NOTICE TO APPLICANTS FOR FELLOWSHIP.

The next examinations for candidates for fellowship in The Massachusetts Medical Society will be held by the censors in the eighteen districts of the state on Thursday, November 1, 1917. The date of the examination was changed when Chapter V of the By-Laws was amended at the annual meeting of the Society, June 13, 1917.

Applicants for fellowship should apply at least a week before the examination to the secretary of the district in which they have a legal residence, taking with them their diplomas in medicine. If non-residents of Massachusetts, they apply to the Secretary of the Suffolk District.

Walter L. Burrage, M.D., *Secretary.*

Berkshire District Medical Society.—The House of Mercy Hospital at Pittsfield, Mass., has concluded a contract with the city for furnishing care for the cases of contagious disease in the city. The hospital will furnish a separate building for this purpose.

The cities and towns of Berkshire County have furnished the men, officers and funds for a complete ambulance unit. After considerable training here this unit was drafted into the army and sent to Camp Devens. The officers include Capt. R. J. Carpenter from North Adams, Lieut. Harry Tate, Lieut. Thomas Littlewood and Lieut. M. H. Walker from Pittsfield.

Among the men of Pittsfield now in active service in the Army Medical Department are Capt. I. S. F. Dodd, and the following as lieutenants: Harry Tate, John Sullivan, M. H. Walker, Jr., Thomas Littlewood, H. A. Schneider, W. J. Lally. A. P. Merrill, *Reporter.*

Miscellany.

NOTICES.

Boston Medical Library.—The Boston Medical Library is trying to make a collection of medical literature of all kinds relating to the war. Contributions of books, pamphlets, newspaper clippings, pictures, broadsides, notices—in fact, anything having a bearing on the medical aspect of the war, will be gratefully received. John W. Farlow, *Librarian.*

Boston Orthopedic Club.—Under the auspices of the Boston Orthopedic Club, there will be held a meeting at the Boston Medical Library on Saturday night, October 6, at 8 p.m. Dr. E. G. Brackett, who is the Director of Orthopedic Surgery and in charge of all orthopedic work connected with the Army, will talk about the plans that have been made to take care of the orthopedic cases in the present war. To this meeting all members of the medical profession are cordially invited, and we are sure that, when we remember that 40%, at least, of the wounded are classified as orthopedic cases, it will be of great interest to the general profession, as well as to the orthopedist. There will be explained the plans that are made for the reconstruction hospitals that are to be built in this country, as well as the large orthopedic hospitals that are planned to be built in France.

Middlesex South District Medical Society.—The semi-annual meeting of the Society will be held at the McLean Hospital, Waverley, on Wednesday, October 10, at 12.30 o'clock, p.m.

Lyman S. Hapgood, M.D., *Secretary.*

Norfolk South District Medical Society.—Meeting for medical improvement at United States Hotel, Boston, Thursday, October 4, 1917, at 11.30 a.m.

Dr. James L. Huntington of Boston, will read a paper on "Certain Causes of Bleeding during Pregnancy: their Significance and Treatment."

For Dr. James H. Cook of Quincy.

Meeting of Censors at office of Dr. F. H. Merriam, South Braintree, Thursday, November 8, at 2 p.m. Candidates should bring diplomas.

F. H. Merriam, M.D., *Secretary.*
South Braintree, Mass.

Conference of Presidents of Examining Boards Called to Meet at Camp Ben Harrison, Oct. 8, 1917.

A meeting of the officers and members of the various Examining Boards for the Medical Reserve Corps is hereby called at Camp Ben Harrison, Monday, Oct. 8, 1917, at 11 a.m. This conference has the endorsement of the Surgeon General, and already nearly one-half of the Boards have responded favoring the conference at that time. Important subjects will be brought before this conference and a large attendance is solicited.

(Signed) Geo. N. Kreider, *President.*
Medical Reserve Corps, Examining Board,
Springfield, Illinois.

The Boston Medical and Surgical Journal

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The Massachusetts Medical Society.

COMBINED MEETING OF THE SECTIONS OF MEDICINE AND SURGERY, JUNE 13, 1917.

NEUROLOGICAL INDICATIONS FOR AND AGAINST OPERATION IN TRAUMATIC INJURIES AFFECTING THE CENTRAL NERVOUS SYSTEM.

BY JOHN JENKS THOMAS, M.D., BOSTON.

IN the time allowed for the presentation of one paper in a symposium on the surgical treatment of injuries of the brain and spinal cord, one can touch only upon some of the more important points, and I beg your indulgence if the statements made in the course of these remarks seem dogmatic. I shall try simply to give briefly the more important conclusions which are the outcome of the observation and study of a considerable number of cases of injury of this nature.

Let us consider first the cases of injury of the spinal column, as these cases present fewer debatable points than those in which there is an injury of the brain.

The spinal cord is damaged in various ways when there is trauma applied to the spinal column, and, in addition, we may have injuries of the cauda or of nerve roots. In falls where the force is applied in the axis of the spinal column, either by striking upon the head, the feet or the buttocks, we may find a compression fracture of the body of one or more vertebrae. In such cases we frequently find no paralysis from injury of the nerve structure at the point of fracture though, in recent cases, a band of hyperalgesia on the trunk or alterations of the epigastric or abdominal reflexes may indicate injury of the thoracic nerve roots as they pass through the intravertebral foramina. Aside from these signs on the part of the nervous system, such fractures can frequently be diagnosed from radiograms. Such cases need to be differentiated from sprains of the back, by the use of radiograms, and are best treated by fixation of the injured portion of the spine by plaster of Paris or apparatus.

In addition to injuries of the nerve roots, these cases not infrequently show areas of hemorrhage or softening in the substance of the spinal cord, at times far removed from the seat of the fracture. Experience in the present war has shown that similar areas of damage to the spinal cord are frequently produced by the impact of high velocity missiles upon the bones of the spine, not only the bodies of the vertebrae, but also the transverse and other processes.

Such a case was that of Eugene C., seen by me in consultation on Jan. 18, 1914. The young man, 25 years of age, about one year before, fell a distance of 30 feet, landing on the buttocks, and showed immediate pricking sensation and pain in the legs, complete paralysis of both legs and retention of urine, followed after two months by difficulty in retaining the urine. There had been gradual partial improvement, but he still showed marked paralysis with atrophy in the buttocks and anterior tibial groups of muscles. There was loss of skin sensation over the buttocks, backs of the thighs and in the legs below the knees, with good sensation in the front of the thighs to a point a little below the knees. The knee jerks were diminished, there was a double ankle clonus, but no Babinski or Oppenheim's signs. There was a rounded kyphosis in the lower thoracic and upper lumbar regions, with fixation, and an x-ray showed a crush of the 1st lumbar vertebra. This case was much benefited by tenotomies of the contracted tendo Achillis and apparatus.

Quite frequently the area of destruction in the cord is found to be unilateral, when there is usually present at first the Brown-Séquard syndrome of loss of superficial sensation in the opposite side of the body from the lesion, with loss of motion and deep sensation on the same side.

Such a case was that of H. A., who was seen by me on April 21, 1917. He was struck by a motor car, knocked down and showed no voluntary motion in the right arm and hand and moderate paresis of the right leg. Strength in the left extremities was good. Skin sensation was much diminished on the left side of the trunk, extending as high as the first rib, and moderately diminished in the left leg. The sense of position was much disturbed in the right hand and arm and slightly in the right leg. Bony sensation as tested by vibration was practically equal on the two sides. The triceps, biceps and radial reflexes on the right were absent, the right knee jerk was increased and there was slight ankle clonus on that side with Babinski's sign, but normal reflexes on the left side. There was marked tenderness of the neck and the x-ray plate showed a slight displacement of the second cervical vertebra.

Cases of this nature, as shown by the results of treatment and the conditions found at necropsy, are not benefited by immediate surgical operation. The treatment should be limited to fixation of the injured vertebral column, in order to promote rapid healing of the injury, and also to prevent further injury of the cord, in case there has been rupture of the ligaments so extensive that displacement of the bones of the spine may occur from handling the patient. This danger is greatest in injuries of the cervical spine.

Cases of dislocation, or fracture-dislocation of the spine in all regions without signs of injury of the cord, require simply fixation of the spine.

More debatable is the treatment of the cases of fracture-dislocation of the spine with injury of the cord. These injuries of the cord are produced almost invariably by displacement forward of the upper fragment of the injured spine, the cord being crushed between the lowest arch of the displaced fragment and the body of the vertebra below. The weight of evidence from x-ray examinations and examinations of these fractured spines at necropsy shows very conclusively that this forward displacement can almost invariably be overcome entirely by fixation of the spinal column in hyperextension. The difficulties arise in maintaining this. Rarely cutting down upon the spine and wiring is required. Hyperextension and fixation is the best treatment of all cases where the examination of the functions of the nervous system shows we have to do with a partial destruction of the cord, as where sensation either for the deeper structures or for the skin is partially retained. The immediate loss of all sensation in joints, knees, muscles and skin, the complete loss of voluntary motion, with absence of the knee and ankle jerks, and loss of control of the bladder, when all present, are in favor of a total transverse lesion of the cord. In addition, recent observations seem to show a special importance attaching to the plantar reflex in the estimation of the amount of damage done to the cord. In milder cases with loss of motion and sensation, the plantar reflex is of the extensor type, often with flexion of the thigh, and dorsi-flexion of the foot—Babinski's sign. In severer cases there is found, on testing for the plantar reflex, occasional flexion of the toes, or a total loss of any response.

It is useless to operate in cases of total crush of the spinal cord, unless it is found to be impossible to prevent slipping of the fragments of the fractured spine by any method of fixation. In cases of partial injury of the cord, immediate operation of laminectomy, or this procedure within a few days, is of no advantage. Cases of injury of the cord which are not operated upon early and show improvement, with retrogression of power later, should be again studied by radiographic pictures to determine the possible compression of the spinal cord by callus. In quite a different class stand another group of cases in which the vertebral arches have been driven down upon the cord, compressing it by fragments of bone. Such cases demand immediate operation just as much as do depressed fractures of the skull. This condition is extremely rare except in cases where the patient has struck the back against some small object during the fall, such as an awning stanchion, or in cases of gunshot wounds of the back. In both cases a positive diagnosis of compression by fragments of bone may be obtained by means of good x-ray plates. Crepitus is of little importance in this connection as it is most often found where there is fracture of the spinous process only and is most frequently absent with fracture of the arch.

I may speak briefly of one other condition in which laminectomy should be considered. This is in cases where the neurological examination indicates a complete crushing of the cord, especially in the cervical region, where the outlook is practically hopeless, and where the patient is seen immediately after the receipt of the injury. In these extreme cases, if the operation can be done within two or three hours, and certainly not later than six hours, after the receipt of the injury, a laminectomy, with careful longitudinal hemisection of the cord, may be tried in the hope of relieving pressure upon nerve structures by the release of hemorrhage within the substance of the cord. In such desperate cases one must not be disappointed by the general absence of any benefit from the operation, as the cases in which this can be expected are few. The only case I have seen early enough after the injury to advise this method of procedure died in about the average length of time after the fall, with no evidence of any benefit; but I may add, the operation, so far as we could judge, did nothing to hasten the end.

I can only say, while, like most aphorisms, it goes too far, that I agree with the witty writer who stated that surgeons no longer operate for fracture of the spine—only some Americans do it.

The question of indications for and against operation in fractures of the skull is, if anything, more complicated than that for injuries of the spinal cord.

In certain forms of injury of the brain this matter can be stated very briefly in its broader aspects. First, in regard to the depressed fractures of the vault of the skull: Where these are compound, the condition of the bone should always be carefully examined, and loose fragments removed or elevated. Fractures of this form where the scalp is uninjured, if slight, and if an x-ray shows no distinct depression of the inner table of the skull, should usually be left undisturbed, but in cases where there is distinct depression or where there is some focal sign of injury of the brain beneath, such as a cerebral monoplegia, astereognosis or aphasia, should be operated upon, and enough of the bone removed to enable one to judge of the amount of damage done to the brain beneath, though, as a rule, little should be attempted beyond the removal of blood clot, so far as it is practicable, and the relief of intracranial pressure by opening the dura if this is high.

In the second place, let us consider the conditions in the bursting fractures of the skull. These have been shown by many writers to be in the nature of fissures, often multiple, which run to the base of the skull. When not compound, either externally or in the ear, or nasal and pharyngeal cavities, with the attendant danger of infection and the development of meningitis or cerebral abscess, these cases require no operative interference except to relieve damage to the cranial contents. The well-known cases of compression of the brain by hemorrhage from the middle meningeal artery, always require operation to remove the clot and check the hemorrhage. In these cases and also in other fissures of the base, a great deal of information may be obtained through lumbar puncture. By this means we can measure with a manometer the pressure of the cerebrospinal fluid in the spinal canal, and, by withdrawing fluid, give some temporary relief if this is increased, and, in addition to this, the finding of macroscopic blood in the fluid, especially if this remains the same in the last fluid drawn as in the first, is of the greatest use. The classical signs of hemorrhage from the middle meningeal artery are well known. The passing away of the initial confusion or unconsciousness with a clearer period followed by gradually increasing unconsciousness, while not diagnostic, as they may be seen in other forms of cerebral trauma, are important, especially when accompanied by convulsive or twitching movements of one side of the body, or paresis which is partial and more marked in the face and arm than in the leg, showing the greatest pressure at the base of the skull over the cortical areas for the facial muscles which lie nearest the point of rupture of the artery. The increase of tendon reflexes on this side, the presence of Babinski's extension of the great toe in testing for the plantar reflex, and the loss of the abdominal reflexes on the same side, are of more importance in deciding that we have compression of one side of the brain than the severity of the paralysis. Usually inequality of the pupils, varying according to the amount of compression of the brain, and conjugate deviation of the eyes may also be used as evidence of unilateral injury of the brain.

A. K. D., age 20, was seen by me in consultation on Oct. 20, 1914. He had been struck on the head at about 2.30 p. m. of that day and was dazed simply, but went home after lying down a short time. At 5.30 p. m., he was found to be very dull, but could be made to walk, and at 6 p. m. he could not be roused. At that time, he showed the slow pulse of cerebral compression, it being 48, to the minute, and did not move the right extremities. He had vomited a couple of times, once during the examination. He was very dull, but protruded the tongue when told, but did not answer questions. There was no voluntary motion of the right arm seen, but the leg was moved at times. All tendon reflexes on the right were increased, with ankle clonus, Babinski, and Oppenheim's signs on the right, but not on the left. The cremasteric reflex was lost on the right and the abdominals much diminished. There was paresis also of the right side of the face. The pupils were of medium size, equal, and reacted moderately well to light. There was some slow oscillation of the eyes, but no conjugate deviation. The blood pressure was 120. Operation was done at once and blood clot estimated at 6 to 8 oz. removed, and the middle meningeal artery, which was bleeding, was tied. The clot was extra-dural. Recovery was complete and uneventful.

In general, in cases of fissure of the skull, we do not have to deal with a gradually increasing intracranial hemorrhage which destroys life by the increase of intracranial pressure, though this condition, whether due to rupture of the meningeal artery or of a basal or other sinus, demands operation for its relief. Hemorrhage from a sinus is much more difficult to reach and check, but, on the other hand, as the pressure in sinuses is less than in arteries, it can more often be controlled by packing, if located in situations where this can be used.

In the great majority of cases of fissure of the base of the skull, however, the damage to the brain consists in the traumatic edema which we know, from the work of many experimenters, follows after blows upon the head, or transmitted to it through the spine, or in lacerations of brain substance with more or less consequent destruction of brain tissue—or a combination of these two. Before considering in any case the advisability of operation, we must have a clear conception as to what can be accomplished by operation. It is obvious that excision of damaged brain tissue producing focal symptoms, cannot relieve them, and only adds to the cerebral trauma. The one thing which can be done by operation in injuries of the cerebral tissues themselves is the relief of intracranial pressure. This can be done for a short period by lumbar puncture, but as the cerebrospinal fluid is formed very rapidly (Frazier estimating that it is replaced on the average every six hours) this procedure must necessarily be repeated in, at most, that length of time. The so-called decompression operation, of removing a portion of bone and opening the dura, offers a much more effective method of relieving the intracranial pressure for longer periods of time. Obviously, such a measure cannot save all cases, and if widespread lacerations of the brain are present, it does very little even to prolong life. What now are the chief symptoms of increased intracranial pressure? They are loss of consciousness, headache, slowing of the pulse rate, blurring of the optic discs, a steadily rising blood pressure, especially if the rise be fairly rapid, and severe vomiting, or occasionally convulsions. Inequality of the pupils, deviation of the eyes, paralysis, local twitching, unilateral changes in reflexes belong among the signs by which, if they are not changeable, we may localize the point, or at least the hemisphere, of greatest injury or edema. I venture to make the statement that in fracture of the skull, signs of local injury of the brain are never, in themselves, an indication for operation. The next question and the one most difficult of all to decide is whether the symptoms in a given case are due to increased intracranial pressure, with moderate cerebral lacerations, or whether these latter predominate and render operation for relief of pressure useless.

In considering the first question, whether intracranial pressure is so much increased in a certain case as to require relief by operation, the general signs, as distinguished from focal signs, are much the more important. Of these, deepening unconsciousness, slowing of the pulse, blurring of the outlines of the optic discs and a steadily rising blood pressure—or much better, in cases where this can be carried out, an increasing pressure of the cerebrospinal fluid, as measured by a manometer, by means of lumbar puncture—are the most important. Let me emphasize here that in speaking of the blood pressure, it need not by any means be high, the important point being that it is rising—not the absolute pressure. We know that cases which otherwise would pretty certainly prove fatal, can be saved by an operation to lessen the intracranial pressure, and in almost all the cases the period of convalescence is shortened, and the irritability, headache and other symptoms generally seen after severe cerebral concussions, are much lessened.

On the other hand, widespread laceration of brain tissue, from hemorrhage into the cerebral substance, is influenced but little in its course or outcome by the relief of the increased intracranial pressure which is generally found in these cases. Have we, then, any means of knowing how extensive damage has been done by these lacerations? Phelps has shown that these are usually quite widespread, and their most common seat is at the base of the brain in the frontal lobes and at the tips of the temporal lobes. Aside from the fact that extensive destruction of cerebral tissue at these points produces no symptoms of loss or disturbance of function by which it can be recognized, the unconscious or confused mental state of these patients precludes any examination of such brain functions as taste, smell, or speech. For these reasons, again, we have to depend upon objective signs which may not always be reliable to indicate to us that the cerebral tissue damage has been from actual destruction rather than from pressure. The most reliable signs of this sort, the presence of which means that an operation offers no probable relief to the conditions present, are these: First, I should place fixed, rigid pupils, most often dilated, which show no reaction to light; and in the second place, steadily rising temperature which, in the absence of infection, is one of the most reliable signs of extensive destruction of cerebral tissue we have. In these cases, in spite of the fact that intracranial pressure can be relieved, the final outcome remains uninfluenced. I need hardly add to these contraindications for operation in injuries of the brain, that the presence of profound shock is always a contraindication to operation.

Let me mention another pitfall into which one may stumble rather easily in deciding for or against operation in injuries of the head. These are cases of apoplexy or intracerebral hemorrhage, which, in falling, have received an injury of the head. I may instance one such case seen recently at the Boston City Hospital, where a woman of about fifty years of age, who was going down a flight of stairs, swayed and fell headlong, striking the head. On entrance, she had a moderately severe scalp wound exposing the bone, where a fissure could be felt by the probe. The blood pressure was moderately high and bloody fluid, drawn in three separate tubes, was obtained by lumbar puncture. The patient was in deep stupor, but moved the extremities of one side and responded to pin pricks, and showed a distinct flaccid paralysis of the face, arm and leg of the other side, with ankle clonus. Babinski's sign of slow extension of the great toe, on testing for the plantar reflex on that side was present, with loss of the abdominal and epigastric reflexes on the same side. Here the fact that the paralysis was more complete than is seen in cases of cerebral laceration, who show similar responses to stimulation; then, too, the fact that the paralysis was approximately uniform in face, arm, and leg, which is rarely seen in cortical injuries, and the loss of the skin reflexes on the paralyzed side, led us to decide in favor of cerebral hemorrhage complicated by fracture of the base. The rapid clearing up of the disturbance of consciousness, and the persistence of the marked hemiplegia, amply confirmed this conclusion.

In closing, I wish to mention one further class of cases of fracture of the skull in which operation is of value. In certain cases where we have found perhaps no evidence of paralysis and no definite reasons for operation, either exploratory or decompressive, the patient may improve up to a certain point, then show a persistent mental slowness, perhaps with irritability. In a few such cases in which I have advised opening the cranial cavity there has been found a dura with an organizing blood clot adherent, and marked and rapid improvement in the mental condition has followed almost immediately the removal of this clot, or the lessening of tension by opening the dura, when the clot was not accessible. In cases where these results were seen, there was always found at operation a marked diminution of the cerebral pulsation as compared with that found in normal brains.

Finally, let me state that in deciding in favor of operation in fracture of the skull, we should always have in mind that the most important object aimed at is the relief of increased intracranial pressure, whether this be due to extracerebral hemorrhage or to cerebral edema, and one should strive to determine in each individual case whether the relief of this pressure is likely so to relieve the threatening condition as to warrant the added risks of cranial operation.

DISCUSSION.

Dr. P. C. Knapp, Boston: I am more than disposed to agree with the conclusions which Dr. Thomas has made concerning the operations for fractured spine. Theoretically, of course, or imaginatively, we may have a hemorrhage proceeding slowly which might possibly compress the spinal cord. I doubt this very much, but it can be imagined, and theoretically, too, we may have a fracture of the spine which goes on so slowly and gradually, as when the arches are crushed in, that the fragments of bone may come down gently on the spinal cord, and compress it and cut off its function. I do not believe such cases exist very often. I certainly have been looking for them for many years and have not found them. The damage to the spinal cord is done when the spine is broken. The sudden fracture of the spine or the driving in of the arches smashes the cord. The harm is done and no operation can benefit it.

The rules of diagnosis of a complete transverse lesion of the cord, which, of course, would preclude any operation, are more or less familiar, but at the same time they are not wholly to be depended upon. Dr. Thomas has spoken of the absence of the plantar reflexes as being indicative of a complete transverse lesion of the cord. I saw one case where laminectomy was done and the operator looked down and saw the two ends of the cord divided, and the boy had a year afterwards a persistent plantar reflex. Then, again, you may get a pretty complete destruction of the spinal cord when sensation is retained. I remember one case where the patient had almost no anesthesia, with just the slightest difference in the sensation above and below the seat of the lesion, yet the autopsy showed a transverse band of softening straight across the cord, and microscopic examination failed to show any normal healthy fibre in that portion of the cord.

Ever since Dr. Alfred Allen of Philadelphia brought forward the project of longitudinal section of the cord in cases of acute softening after injury, I have been hoping to see such a case in time. I never yet have seen one soon enough and am skeptical about the benefit from such a procedure. The theory depends entirely upon experimental evidence, and has not been confirmed to any alarming extent by operative experience.

On the whole, therefore, I feel that any operation upon the spinal cord in case of injury or of spinal fracture or dislocation is of very questionable expediency. The cases that seemed most hopeful in my own experience have proved most disappointing. Once in a great while I suggest operation, but am generally sorry.

In regard to fractures of the skull, it may seem somewhat paradoxical, but a fracture of the skull is a comparatively trifling injury. The fracture *per se* is nothing, except as the brain is injured beneath, and the thing which happens to the brain is of course the hemorrhage or laceration. I do not see that it makes the slightest difference whether the bleeding is from the middle meningeal artery, from a small vein going into the longitudinal sinus, or from any other vessel. Now in the injuries to the brain itself, we cannot bank on much information furnished us by our knowledge of brain localization. The whole group of symptoms on the sensory side, including the aphasias and the visual and auditory disturbances, leaves us pretty completely in the lurch, inasmuch as most of the patients are unconscious and we cannot get information of any value concerning them about sensory changes. There are a good many cases of fractured skull that I am disposed to class as x ray fractures. The patient comes in with a history of injury. For a time he is unconscious, and then comes to, complaining of headache and general uncomfortable conditions without much paralysis, the general condition is fair and the x ray discloses a beautiful fracture somewhere or other. Some 25 years ago Sir Victor Horsley argued that all cases of fracture should be operated on, inasmuch as there was a chance that epilepsy might develop. I think that is a visionary idea. Later experience has shown comparatively few cases that have developed epilepsy and comparatively few epileptics turn up where we can discover any history or evidence of fracture. To be sure, if the x ray shows fracture with displacement of the inner table of the skull, or a fragment driven in anywhere, it would be advisable to operate; but otherwise those cases should be let alone.

Beyond that there are two pathological conditions which arise, the hemorrhage and the oedema and laceration of the brain substance. The only thing we can depend upon in the case of hemorrhage is the existence of paralysis of some sort. If a patient comes in with paralysis, a steadily increasing paralysis, or the simple change in the conditions as shown by a Babinski reflex, or Oppenheim reflex, or difference in the knee jerks, it is wiser certainly to operate.

The abdominal reflexes I consider of comparatively slight value, but in all cases where there is a profound coma and any evidence whatsoever of a paralysis, either evidence we obtain by the patient's inability to move, or by a difference in reflexes, an operation is justificable because that is the one pathological condition we can relieve, and we may and often do save life under these conditions; but the cases of fracture of the base attended by considerable coma, probably increasing, pretty bad general condition, without definite evidence of paralysis more than what is shown by inequality of the pupils or paralysis of some cranial nerve, and especially if there be a good deal of motor restlessness and partial coma, are more strongly suggestive of the laceration which Dr. Thomas has spoken of. Operation may not do very much, but some of the cases certainly are improved by decompression, allowing the brain to drain and any oedema to be relieved.

In such cases we are justified fully in operating for purposes of decompression and that is the one instance where Cushing's subtemporal decompression is of any value. It is certainly of no value in tumors.

INDICATIONS FOR OPERATION ON TRAUMATIC HEAD CASES.

BY EDWARD H. NICHOLS, M.D., BOSTON.

THE lesions produced by trauma of the head are numerous and include:

1. Oedema of the brain due to vaso-motor disturbances.

2. Slight laceration of the brain, practically always accompanied by oedema.

3. Local extra-cerebral hemorrhage, either subdural or extra-dural, generally frontal or temporal, and often slight in amount, also accompanied by oedema.

4. Local extra-cerebral hemorrhage of great amount, subdural or extra-dural, generally due to rupture of the middle meningeal artery, also most often temporal or parietal, again accompanied by oedema, sometimes with, sometimes without fracture of the skull.

5. Diffuse extra-cerebral hemorrhage, usually at the base of the brain, generally due to rupture of one of the cerebral sinuses, usually associated with fracture of the base of the skull, and frequently accompanied by a resulting pressure upon or division of one or more of the cerebral nerves.

6. Severe intra-cerebral hemorrhage, due to rupture of cerebral vessels, practically always associated with extensive fracture of the skull.

7. Fractures of the skull which vary from a mere fissure, often detected only by x-ray, or by local swelling, or tenderness, to depressed fracture, sometimes only of the outer table, often involving the entire thickness of the skull, not infrequently compounded; and, finally, fractures of the base of the skull. These latter fractures are usually associated with rupture of one of the cerebral sinuses. These latter fractures are usually produced by compression. A sphere, if compressed, splits along a great circle between the poles of force, but since the skull is not a true sphere, but is buttressed, with numerous openings, the line along which the fracture may occur is very variable. In these cases, as mentioned under No. 5, various injuries of the cerebral nerves may occur, most often the 6th (abducens) and 7th (facial).

Before speaking of the symptoms which may occur with these different classes of injury, it may be well to emphasize the fact that fractures of the skull, *per se*, are of comparatively little importance, except in cases of compound fracture, and the chief danger of these fractures is the possibility of secondary infection of the cerebral meninges, which may occur. The factor of chief importance is the character and extent of the injury to the cerebral tissue, and it is this question, together with the decision as to what must or can be done, that is of chief interest to the surgeon in traumatic head cases. In other words, the fracture usually is of secondary importance; the brain injury is the serious factor.

Consider the symptoms which accompany the different lesions:

1. Oedema of the brain, if uncomplicated, produces symptoms best described under the clinical term *concussion*. These symptoms vary from slight mental confusion to temporary, sometimes prolonged, unconsciousness, or symptoms of cerebral irritation, delirium, and excitability. Such symptoms generally are produced by a blow on the head of moderate severity, a blow, a fall, football collisions, etc. As a result, it is claimed that vaso-motor disturbance of the brain vessels is produced, serum escapes from unruptured vessels, and as the result there is an extra amount of fluid in the brain, and since the skull is unyielding, pressure on the brain occurs. The mental symptoms are variable, depending upon the degree of oedema. There may be a very temporary mental confusion, the patient may talk rationally on simple subjects, but there nearly always is some difficulty in orienting himself,—he cannot tell where he is, the day of the week or month, etc. There practically always is some loss of memory of preceding events, *e. g.*, the patient cannot remember what he had to eat at the preceding meal, or, in severe cases, cannot recall ordinary events that occurred during the twenty-four

hours preceding the injury, and often cannot remember events for a shorter time succeeding the injury. A notable fact regarding the loss of memory is that the so-to-speak "lost time" gradually becomes less as the patient recovers, but a *complete* restoration of memory seldom occurs, even in mild cases. The "automatic" memory often is fairly good, even though actual memory is quite gone. This is shown often in football games, when a man receiving a slight blow may automatically run through play in response to signals fairly accurately, although quite unable to orient himself in response to questions. Or the oedema may produce cerebral irritation, manifested by excitability, or delirium, and the patient in this condition may become violent and assault bystanders, and occasionally such cases are dangerous. If the oedema is severe, unconsciousness may result, partial or complete, but these cases always can be roused, at least partially, by supra-orbital pressure. Vomiting is frequent. The pupils are equal and react, often violently, and usually are dilated; the face is pale, the patient restless and irritable. The *temperature is low*, normal or subnormal, and the pulse rapid. The blood pressure is nearly always low. The spinal fluid is clear and contains no blood. The unconsciousness seldom lasts over twenty-four hours, although some confusion may last longer, and in many of these cases neurasthenic symptoms may last for a considerable time and many of these patients cannot study or do work requiring close mental application for many months.

Treatment. These cases do not need operative treatment. They should be in bed, be given a strong saline cathartic, liquid diet only and an ice cap to the head. The most essential thing is to have such cases carefully watched for twenty-four hours for the occurrence of coma, increasing unconsciousness, spasm, convulsions or paralysis. This is essential, as some cases, showing at first merely symptoms of oedema, later develop intra-cranial hemorrhage and pressure, and no one, at first, can be sure this will not happen.

2. Laceration of the brain. This may occur from direct violence or more commonly from *contre-coup*. In cases uncomplicated by fracture, this laceration generally is slight, and the hemorrhage generally is not great and usually does not produce focal symptoms. The symptoms are practically identical with those of uncomplicated concussion except for two important facts. In cases of laceration, blood will be found in the spinal fluid, and the temperature is elevated (101°-102°). In some of these cases the blood pressure is a little elevated. What has been said about concussion cases applies to the symptoms, prognosis and treatment of these cases of laceration, except that the convalescence is apt to be longer. Occasionally the increased pressure persists and the mental condition remains confused, and rarely these cases should have a subtemporal decompression done, to prevent mental deterioration.

3. Extra-cerebral hemorrhage (intra-cranial hemorrhage). These cases are associated with oedema, the symptom of which they present, accompanied by focal symptoms dependent upon the amount, location and rate of onset of the hemorrhage. They may be divided into three clinical classes—slight (a), severe hemorrhage with focal symptoms (b), and severe without focal symptoms (c).

(a) The slight cases are produced by the rupture of small vessels, generally from a direct blow, *e. g.*, being hit by a pitched ball. The symptoms are those of oedema together with slight focal paralysis, *e. g.*, paralysis of the speech centre if the blow is over the left side in right-handed people, or slight paresis of the limbs of the side opposite to the injury. Most of these mild cases clear up ultimately, but occasionally the hemorrhage in one of these cases, caught in the meshes of the pia, becomes converted into a traumatic pial cyst and may lead to slight or severe epileptic focal symptoms, which ultimately may lead to severe mental deterioration. These cases are most difficult to decide as to treatment. Each case must be decided by itself; no definite rule can be laid down. Deductions must be drawn from long experience. In doubtful cases the skull should be opened and the superficial clot should be removed to avoid possible late epilepsy, and the operation of choice is a skin-bone-flap in preference to a subtemporal operation.

(b) Severe cases generally are due to rupture of the middle meningeal artery or one of its branches, or from a vessel in the dura. The hemorrhage may be beneath the dura (between dura and brain) or outside the dura (between skull and dura). Occasionally both varieties are present in the same individual, although this is not common, and these severe cases usually are associated with fracture usually of the linear sort. The symptoms vary a great deal. In the classic cases, oedema of the brain occurs, followed later by hemorrhage. In such cases, there is, after the injury, immediate confusion, irritation, or unconsciousness, followed by a nearly normal interval, again followed after a variable time, from a few minutes to sometimes twenty-four hours, by increasing stupidity becoming coma, accompanied by focal convulsions or paralyses. In other cases, the immediate oedema leads to unconsciousness, and a severe hemorrhage occurs before the patient becomes conscious, and early convulsions or paralyses appear. The paralyses in these cases generally begin in the face, since the hemorrhage in most cases is most marked low in the skull, and as the hemorrhage rises the paralysis descends to the arm and leg. The blood pressure in these cases always is high and *increasing*.

All of these cases are operative cases. They are fatal without operation. Many recover promptly with operation. The operation of choice is always a skin-bone-flap operation. Remove the clot, check the hemorrhage, although the vessel often is occluded at the time of operation. In these cases the bone-flap can be replaced and no permanent skull defect will remain.

(c) Severe cases without focal symptoms. These cases already have been mentioned under (b). These cases are the most difficult to diagnose of the lot. They may simulate severe concussions or laceration early, or basilar hemorrhage late. The symptoms of most value are the high blood pressure *constantly rising*, and free blood in the spinal fluid, with no escape of blood or serum from nose, mouth or ears, and no exophthalmos. These cases require most experienced and careful neurological examination. The diagnosis between these cases and basilar hemorrhage cannot always be made. Operation upon these cases is fairly successful, upon basilar hemorrhage almost always disastrous. These are the cases which offer the only excuse for unlimited operation upon unconscious head cases, which in my opinion is not proper. If operation should be done, it always should be by the bone-flap operation.

4. Diffuse basilar extra-cerebral hemorrhage, due to rupture of the sinus (fractured base). These cases often are obvious. The unconsciousness is profound and the patients cannot be roused by supra-orbital pressure. In most cases, there is an escape of blood or cerebro-spinal fluid from mouth, nose, or ears; occasionally brain matter escapes. In severe cases, exophthalmos occurs from retro-ocular hemorrhage. The pupils usually are unequal and dilated, often do not react. The blood pressure is very high (170 upwards). Choking of the disc may appear in two hours, but may be wanting. There always will be blood in the spinal fluid. In a large per cent. of the cases there is paralysis of cranial nerves (1 in 7 cases). These patients die of cerebral pressure, but as a rule the pressure (hemorrhage) cannot be checked. Hence, results of operation in these cases are disastrous. One symptom is an absolute contraindication to operation, that is non-reacting, dilated pupils. In some of these cases meningitis occurs subsequent to the fracture, especially with cases where the fracture takes place through the petrous bone into the ear, and is due to ascending infection. Hence, in such cases, at once irrigate the ear with 1-1000 corrosive, pack with sterile gauze and apply a sterile dressing which is to be changed once daily with extreme aseptic care. Most of these cases are not operative. Decision as to operation should be based on the general condition, on apparent cessation of hemorrhage, with very high blood pressure, choked disc, and reacting pupils. In some of these cases the paralysis of cerebral nerves recovers, since the paralysis is due to pressure; in other cases, it remains permanent. The facial and abducens are most commonly affected.

5. Intra-cerebral hemorrhage — subsequent to trauma — generally is associated with very severe injury both of skull and brain, and the decision as regards operation is based upon the accompanying conditions. The symptoms of intra-cerebral hemorrhage cannot be cured by relief of extra-cerebral pressure.

6. Fracture of the skull, if uncomplicated by injuries of the brain, is of little consequence. A simple linear fracture requires practically no treatment beyond rest. Compound linear fractures, when possible, must be rendered absolutely aseptic to prevent possible ascending meningeal affection. *All* depressed fractures, involving the entire thickness of the bone, simple or compound, should be elevated to prevent possible subsequent irritation of the brain and Jacksonian epilepsy.

CONCLUSIONS.

1. Uncomplicated oedema of the brain almost never requires operation.

2. Slight laceration of the brain with persisting oedema sometimes requires operation to prevent cerebral degeneration. Subtemporal method is the best operation.

3. Slight extra-cerebral hemorrhage seldom requires operation; occasionally demands operation to avoid cyst formation; the operation of choice is always skin-bone-flap.

4. Extensive extra-cerebral hemorrhage, from rupture of the middle meningeal artery, with or without focal symptoms, *always* should be operated on, and always by skin-bone-flap method.

5. Basilar hemorrhage seldom can be cured by operation. When operation is done it should be done on selected cases, for relief of pressure, and usually by skin-bone-flap method.

6. Intra-cerebral hemorrhage cannot be cured by operation, although pressure may be relieved.

7. Fracture of the skull, by itself, is of little importance except when compounded, when it may produce meningitis unless made aseptic. All depressed fractures involving the entire thickness of the skull should be elevated.

DISCUSSION.

Dr. W. E. Paul, Boston: It may be stated that if the diagnosis of skull fracture is established with severe symptoms, operation is warranted and in most cases advisable. It seems desirable to be conservative and permit individuals with conditions favoring recovery to escape the bone deficiency and scar.

What are the conditions that indicate no operation, or a delay in operating? Chiefly they are the lack of severe degree of disturbance of consciousness with a good and prompt recovery of clear mentality; a lack of headache or a speedy subsidence of headache; no paralysis; a lack of injury to various cranial nerves; absence of sepsis; normal temperature; the continuance of normal blood pressure and fundi oculi; a clear spinal fluid; a satisfactory general condition of the patient.

These considerations amount to a restatement in different form of the trite, but always dominant dictum, that the bone fracture is of little importance as a bone injury; the brain injury is the vital factor in the matter of diagnosis, prognosis and treatment.

It is perhaps not going too far to say that many cases have been called fracture in which no fracture existed. The diagnosis is blind at times, with only suggestive rather than out-and-out symptoms. Without signs and symptoms pointing to injury of the brain, and in the absence of unfavorable progress, it seems wise to advocate watchful waiting rather than be too radical about operating.

It is perhaps well to consider the nature of the injury in measuring the need of operation. The late Dr. Mumford called attention to the fact that in a series of cases at the Massachusetts General Hospital, studied by him in 1893, fractures from falls were fatal in 50% of instances; and railway fractures had a mortality of 74%; while fractures from blows on the head usually recovered. Dr. Walton has been accustomed to say that head injury from a locomotive accident he considered serious even if the symptoms were not alarming in the immediate time after the accident.

The treatment of skull fractures by daily lumbar puncture is sound theoretically and its practice has seemed favorable in the hands of some who have resorted to this measure. It would be a desirable measure to practise in the less urgent cases and would not interfere with a trephining operation later.

In fractures of the skull from direct blows operative procedure is desirable usually at the site of the blow. Fragments of bone are to be removed and the subdural space drained and freed from blood. These cases do well or ill according to the amount of parenchymatous injury. With much laceration of the brain and multiple and deep hemorrhages, a fatal outcome is likely, even though the intracranial pressure is relieved.

Such cases also are more likely to be followed by epileptic phenomena, a complication which is probably lessened by operation.

The Temperature as a Valuable Guide to Diagnosis, Prognosis and Surgical Treatment in Cranio-Cerebral Traumatisms.

By J. W. Courtney, M.D., Boston.

Although many of the surgical textbooks still in use waste much valuable space in discussing the various sites and characters of the skull fractures which may accompany traumatic injuries of the brain and its membranes, the modern surgeon and neurologist who come together in council over a given case of head injury, spend but little time on this aspect of the problem before them. The menace of a skull fracture is twofold: By its site it may invite infection, and by its character it may create serious brain irritation or compression. But, after all, the indications for dealing surgically with these contingencies have long since been crystal clear.

The real problem which challenges the combined acumen of surgeon and neurologist is to determine the nature and extent of the havoc immediately wrought upon the cranial contents by the devastating onsweep of a traumatizing force which has but partly spent itself upon the bony container.

In a very small percentage of cases this force may cause merely a concomitant tear of a meningeal vessel or of a sinus to which the fractured bone formerly afforded a sheltering groove. But in the great majority of cases its pathologic effects are in a crescendo scale whose most intense note is represented by an actual tearing of brain substance. This laceration is most commonly observable, as you very well know, in the basal surface of the frontal and the tips of the temporal lobes. And its frequent appearance in these sites is easily intelligible when we consider the scabrous character of that portion of the skull base upon which these brain parts rest.

As a less intense, but, in many cases, no less sinister manifestation of the action of the traumatizing force in question, we encounter in brain or membranes, or both, the condition which we designate *contusion*. Here the clinico-pathologic picture is clear-cut and unforgettable. Everywhere within the contused zone the cortical vessels are injected, the surrounding tissues edematous. Caught within the meshes of the pia there may be a thin glaze of hemorrhage or a more bulky bulla of transudate. Deep within the brain substance itself innumerable tiny terminal vessels are filled with thrombi, and everywhere is the inevitable secondary edema which may be sufficiently extensive to make the entire brain seem like a great sponge filled with fluid.

Such are the important intracranial pathologic possibilities which surgeon and neurologist must face in practically every recent case of cranio-cerebral traumatism. Obviously, then, in a given case there must be the clearest possible determination of the nature, extent and site of the lesions present before any operation other than elevation of depressed bone or the removal of osseous fragments is considered.

For such understanding even the most painstaking and complete neurologic examination is, for many reasons, far from adequate. In intracranial traumatisms there is a fallaciousness about the apparently obvious in neurologic symptomatology that is encountered, as far as I know, in absolutely no other pathologic condition of the cranial contents. One not uncommonly observes, for example, particularly in young subjects, a monoplegia or hemiplegia, due to circumscribed pial edema, whose mode of onset is indistinguishable in point of time and, for that matter, in every other way from that caused by rupture of the middle meningeal artery. The paralysis is identical in the two conditions, likewise the behaviour of the pupillary and other reflexes. And yet it is vitally important, surgically, to be able to determine definitely whether the underlying cause of the paralysis is blood or transudate.

The error most commonly committed by neurologist and surgeon alike is to allow their attention to become engrossed with phenomena which spring from disturbance in or destruction of functionally well known areas in cortex or elsewhere, while they overlook the supremely important fact that lesions identical in kind with those responsible for these phenomena may be wrought at the same time by the same force in widely scattered *silent* regions of the encephalon. This is a point upon which neither too great nor too frequent emphasis can be laid.

Personal experience leads me to declare dogmatically that, of all the diagnostic and prognostic manifestations of intracranial traumatisms, the temperature throughout stands supreme in the scale of importance. Pulse and respiration are, to be sure, not negligible quantities, but I think I may say that a depression of cardiac force is no more significant here than in other forms of injury or disease. Speaking generally, with regard to the pulse in the injuries in question, it is entirely justifiable to say that a practically normal or a full and relatively slow pulse is encountered as often in recovering cases as in those which turn out badly. As to respiration, it is usually a most unreliable measure of the degree of danger that menaces, except in initial shock or in the closing phase of a fatal case. On the other hand, for precious indications, both of a diagnostic and prognostic order, one may confidently look to the temperature.

Let us study first its behaviour in intracranial hemorrhage. The immediate effect of this, as of other forms of traumatic intracranial lesions, is, as every observer knows, to produce shock, with its concomitant subnormal temperature. Unless, however, the bleeding is very extensive and complicated by co-existing alcoholic intoxication, the temperature soon regains the normal and is seldom elevated more than a single degree throughout the entire course of the case, provided no extensive degree of contusion and no degree whatsoever of laceration be present.

In uncomplicated contusion the range of the temperature is equally distinctive. In the generality of cases it rises quickly from the subnormal point caused by shock and may go as high as 102. Almost from the beginning its recessions are striking. On the morning of the day following the receipt of the trauma it may drop to 99, or even to normal, only to rise again in the evening to 101 or 101.5. The next morning may find it at 97.5; the evening at 99, or even 100. Throughout the whole duration of the case its behaviour is consistent. In favorable cases the evening range gradually narrows to the normal point, the morning recession to a point but slightly subnormal. Toward the end, in unfavorable cases, temperature and pulse rise together and may reach a very high point.

In brain laceration the initial fall of temperature from shock is of extremely brief duration. It makes little practical difference whether the tearing of brain tissue occurs in alleged heat-producing centres or elsewhere, or whether this tearing is associated with a considerable hemorrhage. In every case of laceration, regardless of surrounding conditions, the almost immediate trend of the temperature is steadily upward. And in severe cases it may rise to 104 or 105 in a few hours. In general it does not rise so quickly to this height. There may even be, in the course of a few days, recessions, but these are infrequent and insignificant. The fact remains that an early and persistently high temperature after cranio-cerebral traumatism invariably denotes brain laceration.

In the later complications of intracranial injuries—notably in arachnitis and abscess—the behaviour of the temperature is equally constant. As a preliminary to what I have to say on this phase of the problem before us, I desire to state categorically that the occurrence of chills during the course of a case of head injury is decidedly not an indication of pus formation. Curiously enough, chills are not at all uncommonly observed during the course of a case of practically uncomplicated contusion, while in arachnitis they are mainly conspicuous by their absence.

The development of an arachnitic process is, in general, seldom discernible for several days after the receipt of the trauma. Its onset is marked by a sudden jump in the temperature accompanied by such signs of cortical irritation as delirium, somnolence or great motor restlessness. The initial rise may be as much as 6° in a few hours. This more or less sudden and sharp elevation occurring at the epoch above indicated is, in and of itself, distinctive. Even more so, however, are the curious fluctuations in temperature which succeed it. Not only from day to day, but from hour to hour are these observable; and there may be a difference of 4° in the highest and lowest points noted in the space of twenty-four hours. The average temperature may be as high as 103° plus.

In cerebral abscess the behaviour of the temperature may be broadly outlined as follows: It is normal during a sinister period of quiescence which follows the antecedent activity of the process, whatever it may be, that prepares the soil for the growth of pyogenic organisms, and *subnormal* after an abscess has attained sufficient proportions to cause local manifestations of its presence. One must not, however, adhere rigidly to this formula in all cases. In certain cases development of an abscess may take place before the signs of an antecedent process have disappeared. In this event the temperature may continue high to the end.

Here let me make it very clear that I do not claim, in the foregoing, to have covered, in every detail, all the pathologic changes which may result from trauma, or that the temperature in those described unswervingly follows, in all cases, the course set forth. What I do contend, however, is that the changes described are those of most practical importance and that in them the behaviour of the temperature as outlined is sufficiently constant to constitute a guide of such marked value in diagnosis, prognosis and treatment that, by comparison, the signally illusory indications furnished by neurologic examination alone are absolutely negligible.

Equally signal is the service rendered by the temperature in establishing a prognosis and in the adoption of rational treatment. When the chart indicates that a given brain compression is due to a *hemorrhage* which is practically uncomplicated, we know that prompt ligation of a bleeding vessel and the turning out of a clot will doubtless save a patient's life. When it indicates *contusion,* we know that we are dealing with the most insidious and treacherous pathologic process in the whole domain of cranio-cerebral traumatisms—the one, *par excellence,* in which the prognosis must always be guarded, even in cases in which the purely neurologic manifestations are of least sinister omen.

Everyone who has followed attentively the course of events in cases of cerebral contusion knows that only in few—and these of the mildest—can the danger to life be safely considered over before the end of the second week. With disturbing frequency we see cases of this order run along for ten or twelve days with but little or no psychic disturbance and with absolutely no paralysis, then suddenly become hemiplegic and pass out in profound coma. In young subjects hemi- or monoplegic manifestations due to circumscribed pial transudate disappear spontaneously. Trephination for relief of edematous compression in adult subjects is, for the most part, a fruitless expedient.

In connection with *laceration* the trephine is not even to be thought of. This condition is not invariably fatal, however, and even a temperature of 105 does not preclude recovery. In favorable cases convalescence may be painfully protracted and the temperature may for a long time stand at 99 plus. The outlook in *arachnitis* is dark in every case. In *abscess* it hinges largely upon the matter of accessibility. Apropos of operation in connection with abscess, I am again reminded of the subject of the temperature, and take this occasion to state that directly an abscess is evacuated, the temperature is apt to rise a point or two and remain somewhat elevated for 24 or 48 hours.

As I have proceeded with my exposition, it must have become increasingly obvious to those who have favored me with their attention that, while close observation of temperature behaviour in cranio-cerebral injuries markedly broadens our understanding of the intimate nature of their underlying pathology, it at the same time automatically betrays the extreme narrowness of the field of indications for legitimate surgical intervention in these injuries.

In a paper on traumatic cerebral edema[*] written nearly twenty years ago, I expressed my views on the surgery of cerebral traumatisms as follows:—

"Our knowledge of cerebral localization and function has been derived in part from experiment and in part from induction based upon the pathologic findings in cases of brain neoplasms, whose clinical expression has been accurately observed. In the majority of such cases the march of symptoms is slow and the portions of the brain, outside of those immediately concerned in the growth, healthy. In animal experimentation, moreover, where certain portions of the cortex have been successfully removed, this has been done piecemeal, and the remaining *healthy* portions of the brain not traumatized. In these two facts lies the secret of the limitations of cerebral surgery. In the removal of neoplasms the most brilliant successes have always attended those cases where only limited regions of the cortex and its underlying tissue were involved. In the surgery of cerebral traumatisms the most successful results have been obtained when the conditions underlying the immediate injury to the skull have most closely simulated those of a circumscribed cortical neoplasm, namely—uncomplicated middle meningeal hemorrhage."

In the nineteen years and more which have elapsed since the above was written, my views on this subject have undergone no material change. And I am today firmly convinced that every other experienced neurologist, if he be honest with himself, will frankly admit that, for the most part, the trephine is a pitiably crude and unavailing weapon with which to combat the menace of death that lies in the types of injury considered in this present paper.

INDICATIONS FOR LAMINECTOMY IN FRACTURE OF THE SPINE, WITH CORD SYMPTOMS.

BY JOHN B. HARTWELL, M.D., BOSTON.

THE status of laminectomy in spinal fractures with accompanying cord lesions is still undecided. It has enthusiastic proponents who believe that operation is indicated in every instance, and vigorous opponents who believe that operation is never indicated. The argument influencing the former is well stated by Walton[1]: "The benefit of doubt should be given to an operation which has proved at the worst neither materially dangerous to life nor detrimental to comfort, and which at least may be expected to lessen pain, to reveal the nature of the lesion with which we are dealing, and to place the cord in the best position for restoration of its function, where such restoration is possible; and if we may add to these comparatively modest claims the hope that an occasional life may be saved, and an occasional patient rescued from helpless invalidism of the most distressing character, should not the burden of proof be laid upon conservatism?" The conservative's reply is well made by Thorburn:[2] "In man we can't hope for anatomical recovery; vicarious conduction may allow of restoration of function to some extent, but in the case of complete transverse lesion in which vicarious conduction is manifestly impossible, no recovery whatever will take place. I have not satisfied myself that there have been any successes as regards recovery of function, save such as may be attributed to the regeneration of nerve roots only, or to the natural recovery of a cord which was but slightly injured. And further, if it were shown that in one or two instances among the two hundred published cases there had been a definite improvement or recovery, I should be inclined to regard such as the sequel of some error in the original diagnosis, rather than to invalidate a rule based upon such extensive premises."

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[*] Traumatic Cerebral Edema: Its Pathology and Surgical Treatment; A Critical Study. Courtney, J. W., BOSTON MEDICAL AND SURGICAL JOURNAL, 1899, Vol. cxl, pp. 345, 373, 397.

Before we take our position in the controversy let us briefly consider the structures involved in injury, the mechanism of injury, and the results of such injury, in order that we may remove certain popular misapprehensions.

The vertebral column may be likened to a sinuously curved segmented tube, and though the sum total of motion between the segments is considerable, the motion permitted between any two segments is very small. The freest motion is permitted between the third and sixth cervical segments and in the region of the last two dorsal segments. These two situations being points at which fixed and movable segments of the spine join each other, forces applied to the spine are here concentrated, and hence the majority of fractures occur in these two regions.

The spinal cord hangs suspended in this tube. Continuous with the medulla above, it usually terminates between the first and second lumbar segments of the spine, and is loosely anchored along its course by the spinal nerve roots and "during strong flexion an appreciable ascent of the lower end takes place."[3]

The cord does not fill the bone-surrounded cylinder in which it lies. The brain, on the other hand, completely fills the cranial cavity. It is, therefore, plain that the arguments for cranial decompression, which are often applied to the spinal cord, should not apply because of the different anatomical relations which they bear to their respective bony envelopes.

Though direct violence may crush vertebral laminae and drive bone fragments into the cord, or by narrowing the spinal canal cause a compression of the cord, this is not the usual mode of injury. The common mechanism consists in a sudden, acute hyperflexion of the spine, secondary to a force applied at one or the other extremity of the column. By this jack-knifing, the cancellous vertebral bodies are made to bear the bulk of the strain, and they crush. If the force continues, the inelastic bony posterior arch cracks, and lastly the more elastic intervertebral ligaments give way. As a result of this sudden hyperflexion, the spinal cord may be stretched in the less severe cases, or contused or crushed between the posterior upper margin of the body of one vertebra and the lower margin of the lamina of the vertebra above—in the severest cases. But in either case the trauma to the cord is synchronous with the fracture of the vertebrae. The damage done, the recoil follows, and bone pressure on the cord is released unless the crush of the vertebral bodies, with secondary displacement, has been so great as to narrow the spinal canal to a diameter smaller than its contained cord. Too great emphasis cannot be placed on this fact: that the damage done the cord is as primary as the damage done the bone. The medullary injury is immediate in the vast majority of cases, not of gradual onset as some writers lead us to infer.

A second fact on which I believe far too little stress has been laid is that the force that causes the vertebral fracture is so great that in at least one-third of the cases other severe injuries than the spinal fracture are inflicted on the sufferer. Among these may be mentioned skull fracture, fracture of the sternum and ribs, with and without lung puncture and hemothorax or rupture of liver and kidneys, and fractures—simple and compound—of the pelvis and bones of the lower extremities. The particular bearing which these accompanying injuries have is in connection with surgical shock, of which I shall speak later.

Though the vertebral bodies be crushed and displaced, the vertebral arches broken, and the intervertebral ligaments torn, the dura covering the cord is rarely injured. And though bleeding from the bone and venous plexus takes place, it is rarely great enough to cause compression of the cord. Likewise the intradural hemorrhage is rarely of sufficient extent so far to fill the subdural space as to cause medullary compression.

So far as the cord itself goes, Allen[4] has shown experimentally, in dogs, that following a crushing blow to the cord, there is an immediate hyperdistention of the pia-arachnoid with blood and cerebrospinal fluid; the cord itself appears pinker than normal, and on longitudinal incision into the cord substance there is "a goodly outpouring of blood and serum." Histopathologically,[5] within fifteen minutes there are hemorrhagic foci in the gray matter of the cord and a beginning edematous condition noticeable in the white matter. Within an hour the intramedullary hemorrhage has assumed much greater proportions, and the deterioration in the staining properties of the anterior cornual cells, which after three hours is very marked, has already begun. In six hours there is very evident disruption of the cord substance. But in addition to the local damage, as pictured by Allen, Taylor[6] and Thomas[7] have shown not only that the intramedullary hemorrhage above described may extend through the cord for a considerable distance above and below the site of injury, but that similar lesions may be produced in the cord at points far removed from the site of compression.

The immediate result of injury to the cord, whether a traumatic hematomyelia or concussion, a contusion, or a complete crush, is a loss in power of conduction, complete or incomplete, below the point of injury. If the motor or sensory paralysis is not complete, if there is not complete retention of urine and feces, if the deep and superficial reflexes—excepting the plantar reflex—are not lost below the point of injury, it is certain that a complete transverse lesion of the cord has not taken place. But, unfortunately, the reverse is not true. All the signs of a complete transverse myelitis may be present and persist for days or weeks, and then sensation or motion or reflexes return, and thereby prove that first appearances were deceiving. Unfortunately, it is only by "watchful waiting" that a positive diagnosis of the extent of the cord injury can be made.

In his experimental work on dogs, Allen found that an impact of 340 gram centimeters, or less, would cause a paralysis from which the animal would spontaneously recover, but with an impact of greater force a permanent paralysis ensued, unless an early incision into the cord was made for drainage. In the latter case, an impact of 450 gram-centimeters on the cord was survived.

The same principle undoubtedly applies to man. If the squeezing is not too great, spontaneous recovery of function will take place. If the compression exceeds a certain force, no recovery of function can be expected, unless, in rare instances, incision for drainage at the primary site of injury be practised within six hours. Of course in man the degree of cord compression in any accident cannot be estimated, and we do not know that the cord of man will be destroyed to the same extent after six hours as the cord of the dog. But it is probably safe to venture that the human spinal cord is more highly developed and more sensitive to injury than the cord of the dog. And those patients who are seen with signs of a complete medullary destruction should, I believe, be considered to have sustained an injury beyond the reach of surgical help.

Shock is mentioned in practically all the literature on spinal fractures, and leads to the inference that shock is to be expected in patients who have suffered this injury. However, in a recent review of the 133 fractures of the spine treated at the Massachusetts General Hospital between January 1, 1900, and December 31, 1914, shock is noted in less than one-quarter of the cases. And those patients in shock had received other severe injuries than the spinal fracture. Uncomplicated fractures of the spine, regardless of the extent of the accompanying cord damage, do not cause shock. The natural corollary to this statement is that shock indicates other injuries—which may be obscure—and though the patients may rally from the shock, the causative injuries may rightly modify the indications for treatment. For example, in the series studied, though treated expectantly, 100% of the patients with fracture of the cervical spine with other injuries died; 80% with fractures in the dorsal region, and 70% with fractures in the lumbar region and accompanying injuries, died. Compared with these figures, there was a mortality of 70% in the uncomplicated fractures in the cervical region, and no mortality in either the dorsal or lumbar segment fractures. The large series of cases described by Gurlt,[8] Black,[9] Burrell[10] and DeQuervain[11] make no note of the injuries sustained by the patients in shock, so the above assertion finds no confirmation from them.

Laminectomy, no one will dispute, is a major operation, and carries with it a definite mortal risk. Nor is the risk so small as many would lead us to assume. Lloyd[12] stated that in 59 out of 227 cases collected by him, death may have been hastened by operation; 55 of the 218 cases collected by DeQuervain died within a few days after the operation, though he does not specifically state that the operation hastened death; in the series studied by me, 4 deaths in 35 laminectomies were attributable to the operation—2 deaths on the table, one death an hour following operation and one death from a septic meningitis.

Laminectomy does not give a better idea as to the extent of cord destruction than can be gained from the clinical signs alone. In the series of cases I studied, the condition of the cord was noted in 30 of 38 cases subjected to laminectomy, all of whom presented signs of extensive cord damage. But in 13, or over one-third of the cases, operation revealed no demonstrable injury to the cord. In 12 cases—another third—the cord was found "crushed" and the operation was, therefore, useless, and in the remaining cases the cord was described as "lacerated," "thinned" or "slightly discolored."

Fractures of the cervical segment of the spine with accompanying cord symptoms are particularly fatal, and death is almost invariably hastened by complications referable to the respiratory tract. The paralysis of the intercostal and abdominal muscles makes coughing impossible, and the mucus that collects in the trachea and bronchi can, therefore, not be expelled. Cyanosis and dyspnea appear early in these cases. They do not take ether well, and I believe that the administration of any anesthetic is absolutely contraindicated. Add to this the possibility of traumatizing the cord and the consequent death from respiratory paralysis, and the sum of the dangers to which the patient is subjected by operation outweighs the probable benefit.

Fractures in the dorsal region are far less fatal. There is no respiratory difficulty, and the dangers of administering an anesthetic are no greater than normal, and operative trauma to the cord a few segments above the site of greatest injury will not be fatal. In the lumbar region the cord itself may escape injury, and the damage that results from compression may involve only part of the cauda equina, which is amenable to suture.

Apart from the usual cases of broken back with immediate onset of cord symptoms, there are a few exceptional cases of fracture of the spine in which the medullary symptoms either are very gradual in onset or make their first appearance some hours or days after the original injury.

There is a third class, in which the vertebral fracture was originally unaccompanied by cord symptoms, or in which the cord symptoms were very slight and of short duration (for example, retention of urine for four or five days), but in which, after a lapse of several weeks or months, medullary symptoms begin to appear and slowly increase. In these cases there is true compression of the cord, be it by bone callus or by an infolded ligamentum subflavum or by a localized serous meningitis.

Certainly an operation cannot be indicated unless there is a reasonable prospect of bettering existing conditions or of prolonging life under existing conditions. In the usual type of fracture of the spine, accompanied by cord symptoms of immediate onset, these indications should lead us in paths of conservatism rather than of radicalism, and our indications for operation should be special and not general, and we must not be unmindful of the fact that where spontaneous improvement does take place it usually does not manifest itself short of from four to ten days.

Laminectomy, I believe, is absolutely contraindicated in all cases of fracture of the cervical segment of the spine in which there is a paralysis of the intercostal and abdominal muscles, and is contraindicated in all fractures of the spine, wheresoever located, with cord symptoms of immediate onset, howsoever slight, if other severe injuries are demonstrable, or if the patient presents or has presented the signs of surgical shock.

Laminectomy is contraindicated in cases of fracture of the spine with synchronous cord injury, in which the signs point to a complete crush of the cord, until at least four days have passed—the minimum time in which spontaneous improvement can be expected to manifest itself—and if no spontaneous improvement is shown, I do not believe that operation offers any real hope.

Laminectomy is justifiable in cases of fracture of the spine, accompanied by cord symptoms which do not point to a complete cord destruction, if the patient comes under observation within six hours, and if during the period of observation the cord symptoms are progressive. In such cases laminectomy with incision into the cord substance for drainage should be practised at once.

Laminectomy is urgently and immediately demanded in those cases of spinal fracture in which cord symptoms are of slow onset and progressive, and in those cases originally free from cord symptoms, in which medullary signs make a sudden appearance.

Laminectomy is indicated in those fractures of the lumbar spine in which the cord symptoms indicate injury to the cauda equina, and in these cases an attempt to suture the crushed trunks should be made.

Laminectomy is indicated in those cases of old fractures of the spine in which cord symptoms were originally absent or slight and of short duration, but in which symptoms of pressure on the cord develop late.

REFERENCES.

[1] Walton, G. L.: Jour. Nervous and Mental Disease, 1902, Vol. xxix, p. 1.

[2] Thorburn, William: British Med. Journal, 1894, Vol. i, p. 1345.

[3] Piersol's Anatomy, p. 1021.

[4] Allen, A. R.: Jour. A. M. A., 1911, Vol. lvii, pp. 878-880.

[5] Allen, A. R.: Jour. Nervous and Mental Disease, 1914, Vol. xli, pp. 141-147.

[6] Taylor, E. W.: Jour. Boston Soc. Med. Sci., 1898, Vol. iii, p. 60.

[7] Thomas, J. J.: Boston City Hospital Reports, eleventh series, 1900, p. 2.

[8] Gurlt, E.: Handbuch der Lehre von den Knochenbruechen, Hamm, 1864, Vol. ii.

[9] Black, C. E.: Illinois Med. Jour., 1902, Vol. iv, pp. 299-308.

[10] Burrell, H. L.: Annals of Surgery, 1905, Vol. xlii, p. 481.

[11] De Quervain, F.: IIme Congrès de la Société Int. de Chir., 1908, Vol. ii, pp. 687-734.

[12] Lloyd, S.: Jour. A. M. A., 1901, Vol. xxxvi, pp. 1116 and 1247.

DISCUSSION.

Dr. Isador H. Coriat, Boston: Dr. Hartwell has presented a most interesting and valuable contribution to the subject of spinal cord surgery, while his description of the mechanism whereby the cord suffers actual injury from accident, is remarkably clear. The surgery of these conditions is not within my province, but a brief statement of the problem as it presents itself to the neurologist may be of interest.

From the clinical standpoint alone, it is sometimes very difficult to make a diagnosis of fracture, particularly if deformity or tender points cannot be demonstrated. The conditions most likely to be confused are hematomyelia and certain cases of what may be termed acute oedema of the cord, as these conditions, under certain circumstances, may present the clinical picture of a complete transverse lesion. A complete neurological examination is essential in all cord injuries, in order to determine the height and extent of the lesion and also in an attempt to differentiate an actual crush from a hemorrhage into the central canal or central gray matter by means of the sensory reaction to heat and cold. The x-ray may also be of help, although of less value than a thorough clinical examination, since cases exist in which the x-ray shows a fracture with few or no cord symptoms, or, on the contrary, severe transverse cord symptoms may be present without the radiographic evidence of fracture.

The presence of even diminished or a few reflexes below the point of compression, or of disseminated areas in which there is no disturbance of sensation, or of an irradiation of reflexes or a contralateral reflex, is evidence that a certain amount of conduction is taking place in the spinal cord. For instance, in stroking the soles of the feet, even if the plantar reflex is absent or diminished, if there takes place at the same time a contraction of the quadriceps, this points to cord conduction, an overflow of the reflex from the point of reflex discharge.

I believe that if there is found an incomplete lesion of the cord after injury, as evidenced by the reflexes or the sensory disturbances, that a laminectomy should be done at once before further hemorrhage or oedema takes place. If there are signs of a complete transverse lesion of the cord, no harm is done by waiting 24 to 48 hours, first for the oedema to subside and secondly, because cases of acute oedema of the cord may produce a clinical picture of a transverse lesion, due to a temporary suspension of function, as in experimental concussion of the brain.

An exploratory or decompressive laminectomy is not dangerous provided there is not too much surgical shock or if there is no evidence of diaphragmatic paralysis. The latter condition may lead to pulmonary oedema with cyanosis and inability to expel mucus; and I agree with Dr. Hartwell, that the administration of an anaesthetic in these cases is contraindicated. In addition, I feel that a rapid increase in the cord symptoms is a contraindication for operation, and a cervical lesion offers a far more grave prognosis than a dorsal or upper lumbar lesion.

In a paper on some cases of spinal cord surgery which I published in the Medical and Surgical Reports of the Boston City Hospital in collaboration with Dr. Crandon several years ago, I expressed the same viewpoint on decompressive or exploratory laminectomy as I do today.

In closing, I am reminded of an interesting case of fracture of the fifth cervical vertebra, which I saw over a year ago in consultation with Dr. Ehrenfried, and which was operated on by him at my suggestion. In this case there were symptoms of a complete transverse lesion comprising everything below the first dorsal segment, with complete flaccid paralysis of both legs. The symptoms were increasing at the time operation was done, on the third day. Laminectomy showed that the cord was decidedly oedematous, partially crushed, and with a probable hemorrhage into the central gray matter. The x-ray showed a fracture of the body of the 5th cervical vertebra with displacement of the upper fragment against the cord. After this decompression the patient made a fair functional recovery, which I feel would not have taken place without an operation. He is at present able to get about comfortably with crutches. This case was particularly valuable, since I was able to follow it for a long period of time and make a series of neurological examinations.

Dr. Samuel J. Mixter, Boston: The question of operation in fractures of the spine is one that has never been settled and never will be, I think. It depends largely upon the feeling of the individual surgeon, that is, his feeling at the time of the operation, whether he is optimistic or pessimistic. It is hard to make a correct diagnosis. We can make a better diagnosis now with the x-ray than we could before, but that does not give us news as to the condition of the cord. The symptoms may mislead. You may have all the symptoms of a complete transverse lesion, and yet the patient may recover, and then you know that he did not have the transverse lesion. I remember seeing one case in consultation of a young boy who was shot in the back directly in the median line. He had complete paralysis, and all the symptoms of complete transverse lesion. A most unfavorable prognosis was given and operation was advised against. He recovered, and it was simply a mistake in diagnosis. Just what happened I do not know. That was before the days of the x-ray.

It makes a great difference as the reader has said, where the lesion is. If the lesion is in the neck it is very serious, however slight the damage to the cord. Now the question comes, what to do with fractures, whether to operate on them or not. The answer to that question is entirely dependent upon whether the case is a fresh one or an old one. If it is a fresh one, I think it is perfectly justifiable to operate on the case. In the instance I spoke of, the boy recovered from what was apparently a complete transverse lesion, without operation. I have operated in two cases where we thought it was complete transverse lesion, and the patients have recovered. They might have recovered if I had not operated. No one can say. I am very sure that none of the cases that I have operated on for fractures of the neck have been killed by the operation *per se*, and in these days when the operation can be done by a local or regional anesthesia, as is now done by Fraser and others, the operation is very much safer.

There is mighty little chance, in operating on a man with a broken neck, of pulling him through. Once in a while one gets well. At any rate, I think it adds little to the danger. I said years ago, and I have not changed my mind very much, that a person who did spinal surgery, surgery for broken backs, broken necks, etc., should enter on the thing without great hope as to results, and certainly with no enthusiasm, because most of the cases will not be benefited.

When Allen and Fraser showed their dogs in which they achieved such wonderful results by longitudinal section of the cord, we were very much encouraged. In talking with Dr. Fraser last week, he told me that he has seen nothing in the clinical work so far to encourage him especially. It has been absolutely negative.

The cases that should be operated on are those with increasing symptoms, whether fresh or old, or perhaps those which show in the x-ray a definite change in the lamina of the canal. Even those cases may not be helped. Wherever there is a chance of a few fibres being left, operation certainly offers the best chance and puts the cord in the best state for healing. Drainage alone helps and if a person has those few fibres, or if you think they may be there, I think it is better to operate and give him what chance there is. That is mighty little. Your statistics will be bad, but as I have said elsewhere, the man who will not operate on account of hurting his statistics is not only a coward but a knave. That is simply my personal feeling about operations on the cord. I have no joy, and very little hope, and absolutely no enthusiasm.

Fractures of the Base of the Skull at Massachusetts General Hospital.

By W. J. Mixter, M.D., Boston.

For the purposes of this paper all the case records of fractures of the skull, base and vertex, concussion and intracranial hemorrhage brought to the Massachusetts General Hospital since 1890 have been studied. From this mass of records has been selected every case in which fracture of the base was proven or practically certain. The records were then gone over again and all cases first seen more than two days after injury, all cases of multiple injury in which the patient died within two hours of his entrance to the hospital were culled out. This left the early cases of fracture of the base, eliminating such as were moribund when brought to the hospital and on which operation could not be considered.

For the purposes of this paper the term "operation" may be taken to include only those surgical procedures having a distinctly decompressive effect.

In 1911 the cranial work at the Massachusetts General Hospital was given as a special assignment to Dr. S. J. Mixter and Dr. John Homans. Later the assignment was given to me and, for a portion of the time, Dr. J. B. Hartwell was associated with me in the work. For this reason the periods since 1890 are divided, not strictly by decades, but with regard to this date.

Fractures of the Base.
1890–1917.

		Mortality
Total number of cases	301	
Total deaths	163	54.1%
Cases treated expectantly	209	
Deaths	123	58.3%
Cases treated by operation	92	
Deaths	40	43.4%
Cases treated by operation	30.6%	

Cases Divided by Periods.

	1890-1900	1900-1911	1911-1917
Total number	101	126	74
Operations	9	29	54
Cases operated on	9%	23%	71.5%
Total deaths	68	68	27
Mortality	68%	54%	36.5%

Incidence of Proven Meningitis.

Without operation	7
With operation	1

Incidence of Proven Intracranial Hemorrhage.

Without definite localizing signs	12
With definite localizing signs	19

		Mortality
Operations performed within two days of time of injury	85	
Deaths	35	41.2%
Operations performed more than two days from time of injury	7	
Deaths	5	71.0%

Average Time in Hospital of Cases that Recovered.

Treated expectantly	21.8 days
Treated by operation	20.6 days

Summary of Percentages.

	Operations	Mortality
Total	30.6%	54.0%
1890-1900	9.0%	67.0%
1900-1911	23.0%	54.0%
1911-1917	71.5%	36.5%

These statistics may seem a bit startling and it is only fair to state that changes in the community may have a little bearing on them. For example, the building of the Relief Station in Haymarket Square has cut down the number of our severe accident cases from the City of Boston, while the development of small hospitals throughout the state and industrial accident insurance have tended to diminish the number of cases we receive from the railroads. On the other hand, the increasing use of automobiles tends to bring the number up. I have the impression, however, that we are not getting quite as large a number of desperate cases as we did when I was a house officer. It is also probable that we are now more able to prove a diagnosis of fracture of the base than we have been in the past.

These tables show a fairly constant number of cases throughout the past 27 years but a very marked decrease in mortality associated with a marked increase on the number of decompressions performed.

A fact of great interest, and one on which I wish to lay especial emphasis, is the relatively high mortality in late operations. I wish also to call attention to the fact that massive hemorrhages were found at autopsy or at operation in 61 cases, and that localizing neurological symptoms were lacking or confused in 60% of this number.

The comparative rarity of proven meningitis was a great surprise to me as I had expected to find quite a large number of cases showing definite evidence of meningeal infection. Doubtless there were a good many other cases which had meningitis but it was not shown in the records.

I shall not go into the indications for operation in fracture of the base as that is covered by Dr. Nichols' paper, but shall state briefly our usual routine on such cases when they come to the accident ward.

At entrance a careful examination is made, including urine and blood pressure, and the history obtained from bystanders, police, etc. A half hour pulse record is started, x-ray taken of the head and, in most cases, lumbar puncture is done.

As a rule, the decision for or against operation can be made at once, but in a certain number of doubtful cases it is necessary to wait from 6 to 24 hours in order to observe the increase or decrease in symptoms. If the decision is made to postpone operation or not to operate at all, the patient is sent to the ward and the pulse, temperature and blood pressure watched and the condition of the eye grounds noted at intervals. Epsom salts, by mouth or stomach tube, and an enema are usually given within a few hours. The general pressure symptoms and the general condition of the patient are of fully as great importance as an indication for operation as any localizing signs.

If operation is indicated and there are no localizing signs, a right subtemporal decompression is performed as advised by Dr. Cushing. This operation gives access to the portion of the base most frequently injured, the middle meningeal artery, and permits of a fairly thorough exploration of that portion of the skull and brain. It uncovers a silent area so that if the brain presses strongly against the sides of the opening there is no resulting paralysis.

A left-sided subtemporal decompression is more dangerous as it uncovers the speech centre. If there are definite localizing signs as shown by the neurological examination, depressed bone or x-ray, the place of operation is chosen so that the portion of the brain indicated may be explored.

A moderate-sized decompression is usually sufficient, although, at times, extreme bulging of the brain makes it necessary to attack both sides. The inside of the skull is explored as far as possible, and loose or depressed fragments and extra- or intradural clots removed and hemorrhage controlled as far as possible. A rubber drain is then placed well down to the base inside the dura, which is left widely open, and the temporal muscle and scalp are closed about the drain. It is not necessary to make this closure in as painstaking a manner as in tumor cases as the bulging, as a rule, only persists for a very short time. The drain is removed at the end of 24 to 48 hours and should never be replaced.

Perhaps the most striking thing to me in the series of decompressions for fracture of the base which I have performed is the great excess of cerebro-spinal fluid under pressure, which is so frequently encountered, and the profuse drainage which occurs for a day or two. This increase in cerebro-spinal fluid is found only in the early cases, whereas in the old cases (48 hours or more after injury) the brain itself seems edematous, bulges strongly into the opening and effectually prevents any subsequent drainage of cerebrospinal fluid. I take this to be an added reason for early operation and this is borne out by the higher mortality in the cases I have seen in private practice, a large per cent. of which have come under my care from three days to a week after injury. The late operation is much more difficult and dangerous on account of the danger of rupture of the bulging brain.

In concluding I would sum up as follows:

Decompression in the proper cases of fracture of the base of the skull markedly lowers the mortality.

Localizing signs are of value but are certainly no more important than the evidences of increased intracranial pressure.

Operation should be performed as early as possible, as late operations are much less effective.

A Brief Report of Cases of Fracture of the Skull and Spine, from the Fourth Surgical Service, Boston City Hospital.

By Frederic J. Cotton, M.D., Boston,
and
William F. Cotting, M.D., Boston.

The brief summary herewith given presents simply the summary of the cases entering the fourth surgical service at the Boston City Hospital since March 1, 1916, in which there was skull fracture actually demonstrated or suspected or fracture of the spine. Fifty-one cases were listed.

The cases were taken as they came, and the series expected to make out a case in favor of certain theories held by the surgeons on this service.

This they do though perhaps in the rather cold and grudging way which is the habit of statistics. Of this more in the concluding paragraph.

First as to the skull cases:

There were thirty-eight cases so listed. Of these, four were to be subtracted—data insufficient or obviously did not really belong to this series.

There were ten that represented only the picture of mixed alcohol and concussion, only too familiar in a municipal hospital on the first two days of the week, all recovering in the usual prompt fashion, and calling for no further attention. Three were of rather severe concussion, unconscious but tending to improve, and recovered substantially in 12-72 hours. All recovered fully.

There were twenty-one cases of definite skull fracture in all; fourteen of them treated—or untreated—without operation on the skull.

1. One case showed unconsciousness and spasticity without localizing symptoms. Spinal puncture showed bloody fluid. He had fallen at the end of a prolonged debauch, was in wretched shape and died before anything was done.

2. In one other case there was obvious alcoholism, no fracture detected, no signs of brain trauma. At one time, after four days, the writer was on the point of doing a decompression for brain edema, but the man got suddenly better, only to collapse suddenly and die a couple of days later. Autopsy showed a fracture and brain laceration to reinforce the alcoholic condition. This man would have stood a better chance if decompression had been done, perhaps.

The other eleven recovered without operation, other than the cleaning out of the wound in the five that had scalp wounds: the list is appended, because these cases were *deliberately* let alone, yet several of them seem to fall within the limits of usual "operative cases."

3. Woman of 40. Had fallen downstairs; unconscious, but could be roused to mumble a few words. Pupils without light reaction. Left eye showed subconjunctival hemorrhage and marked exophthalmos. Ecchymosis about both eyes. Rather profuse bleeding from both ears and from nose. Reflexes not abnormal.

This patient had an obvious fracture of the base—anterior and middle fossae, probably a very extensive basal fracture, but bad as the condition was she seemed to be getting no worse and there were no focal signs of brain pressure. No signs of increased intracranial pressure.

Nothing was done.

In four days the exophthalmos was practically gone, she was conscious though not rational.

Twelve days after entrance she was transferred to the nerve service, irrational and noisy—apparently from alcohol, but without physical signs of any damage from the trauma.

4. Struck by falling log. Confused, not unconscious. Odor of alcohol. Unequal pupils. Orbital ecchymosis on left. X-ray showed parietal fracture. No operation. Developed acute delirium after four days, also partial paralysis of left arm and double Babinski. Blood pressure 125-100. At eleven days became entirely rational. Recovered.

5. Fell on ice. Irrational. Lacerated wound of eyebrow—stellate fracture beneath it shown in x-ray. Reflexes sluggish. No operation. Recovered.

6. Boy of 6. Fell down two flights of stairs, striking back of head. Semi-conscious. Hematoma over back of skull. X-ray showed occipito-parietal fracture. Marked stiffness of neck (x-ray shows this to be due to neck fracture). What was especially interesting was the result of the eye examination by Dr. Williams, who found beginning choked disc. Dr. Fairbanks' neurological examination found no focal signs and no signs of intracranial pressure other than the choked disc.

We decided to await developments.

The choked disc presently subsided and save for the neck damage the child was entirely well after three weeks.

7. Woman. Wound from right eye to ear. Fracture right parietal shown by x-ray. No focal signs. No operation. Recovered.

8. Fell 15 feet. Unconscious. Scalp wound left parietal. Pupils dilated. Knee jerks exaggerated. Respiration slow, stertorous. Pulse 100. Two days later delirious. Temp. to 104. Normal two days later. X-ray shows parietal fracture. Speech thick for a time but cleared. Entirely well at fifteen days.

9. Woman. Fell down stairs. Subconjunctival hemorrhage both sides. No symptoms save dulness. Well at eighteen days.

10. Boy of nineteen. Struck by car. Confused. Bleeding from nose. Profuse bleeding and loss of cerebro-spinal fluid from both ears. Pupils contracted, unequal. Abducens paralysis both eyes. (Also fracture of lower spine accounting for absent knee and ankle reflexes.) No operation on skull. Recovered showing only prolonged irritability and slow recovery of abducens paralysis.

11. Man of 52. Struck by car. Scalp wound under occiput. Comatose. Can be roused partly. No paralyses. X-ray showed fracture of the base posteriorly. Recovered without operation. Well at 12 days.

12. Fell ten feet. Wound on forehead. Fracture frontal bone. No brain symptoms. Recovered without operation.

13. Kicked by horse. Compound fracture frontal bone. Cleaned out. No other operation. Recovered entirely save for slight ptosis, persisting after eight days.

14. Boy of fourteen. Double subconjunctival hemorrhage, severe, with a little exophthalmos and some dulness mentally. Recovered completely, though the hemorrhages were a long time absorbing.

Now as to the cases operated on, the reasons, and the results.

15. Boy of eight. Sewed up as scalp wound by outside doctor. Septic on entrance. No focal signs except weakness of left hand, but an obvious fracture of the vertex. X-ray showed a plate of at least an inch depressed for ¾-1 in. Kept six days until the wound was clean. Then operated on. On removal of the fragment there was terrific hemorrhage from the torn longitudinal sinus which could not be picked up in the mess of torn brain tissue, but was readily controlled by packing held in by suturing flaps over it. Four days later this pack was removed. He did perfectly well except for slight paresis of the one hand, clearing slowly when he was discharged.

16. Boy of two. Fell three stories. Semi-conscious. Left arm with spastic paralysis. Left leg distinctly paretic with knee jerk increased on left, and left Babinski. Systolic pressure 80.

We waited on this case, but while the power partly returned to the left leg and the arm was no longer spastic, yet the arm was paralyzed still and the mental condition did not clear.

Accordingly, a right-sided parietal decompression was done. Brain found under slight pressure. On opening the dura there was prompt improvement in both pulse and respiration.

Within two days he became, and thereafter remained, free of all brain symptoms.

17. Small boy. Struck on head with a shovel. Semiconscious. No localizing nerve signs. Compound fracture over left parietal region with depressed fragment. Immediate oper-

ation. Removal of fragment, drainage of torn brain tissue. Next day developed paralysis of left arm and face. On the fourth day blood clot removed from under the sutured flaps. At eight days remained only some weakness of the hand.

18. Aged 12. Fell from a truck, on his head. Admitted unconscious. All reflexes increased, left more than right. Double Babinski. Slight bleeding from the nose. Spinal tap showed bloody fluid. Fracture evidently basal. On the fourth day Dr. Thomas advised decompression. This was done on the ninth day as he did not clear up fast enough. A typical left parietal decompression was done. Brain not pulsating until dura was opened. No blood or clots found.

Four days later he was conscious and rapidly became rational though continuing to be irritable. At twenty days he went home well.

19. Fell down stairs. Alcoholic. Two wounds left occipito-parietal, right parietal with depression of bone under the latter. Irrational. No localizing signs at first, but after three hours whole left side became paralyzed. Knee jerk absent. Babinski present on the right side. Next day operation showed very large epidural hemorrhage which was cleared out and the cavity packed. The paralysis disappeared promptly and entirely. Unfortunately he died after a week of erysipelas of the face—not from the wound.

20. Aged 17. Struck by automobile. Semiconscious. Compound fracture right occipital low. No focal signs. Blood pressure 108-80. Some bleeding. Immediate operation to remove fragments and clot. Drained for four days. Sepsis developed, very slowly. At eleven days wound explored and cleaned out. Five days later on account of temperature the wound again opened up—deeply. No pus found. Lumbar puncture at twenty days showed streptococcus in the fluid. He developed a brain hernia, became comatose and died on the 24th day.

21. Aged 11. Struck with an axe on left parietal region. Brain oozing. Conscious. No focal symptoms. Immediate operation. Removal of small fragments and clot. After five days scalp wound showed sepsis. A week later developed left internal strabismus. After 23 days a second operation showed pus beneath the dura. At 50 days third operation showed considerable abscess deep in temporal lobe. Ten days later developed brain hernia and bilateral exophthalmos and died on the 65th day.

It will be noted that of the seven deaths in this series, two were from wound sepsis, one from facial erysipelas, one in a case beyond hope to start with, and only one from causes that might have been mitigated by operation.

Stated in another way, of 21 cases of proved skull fracture, only seven were operated on; of these there were no deaths following operation save by way of sepsis—late; while of those not operated on there was one death in a hopelessly smashed case and only one death from *alcohol* combined with trauma in which operation after 3 - 4 days would perhaps have been better.

It has been the service rule *not to do radical operations early,* just to clean up compound damage and to await results.

About fifteen years ago the rule was prompt decompression, and the mortality was frightful.

About four years ago this scheme was revived and still has a vogue not as yet fully checked by the results—which have been very bad so far as seen.

If one operates early there is a large percentage of deaths, occurring with curious accuracy 10 or 12 hours after operation, from a combination of shock, uncontrollable leakage of blood and of cerebrospinal fluid.

Certain cases like that one of the subdural hemorrhage just cited, growing steadily worse from hemorrhage, must be operated on and take their chance.

In the main, however, if we can wait,—and we mostly can wait safely from 48 - 72 hours,—then the bleeding has ceased, the shock is over, and we can operate or not—mostly not, without much risk and for definite reasons.

Depressed fragments, signs of cortical pressure, persistent slowness in clearing of the mental state, with or without signs of actual pressure, are the indications and the only indications.

In the early stages, particularly in base fractures, intracranial pressure is not the sole trouble; when they die it is apt to be from an operation which renews bleeding as it removes pressure, a bleeding from sinuses or little basal veins that we cannot control, which with the added trauma is enough to turn the scale.

Of the spine cases, fourteen in all, three were fractures of the transverse processes only, hardly worth discussing here, interesting only as to whether this fracture amounts to anything as to prognosis or is a negligible factor.

One was of the not unfamiliar type of compression or flexion fracture of the first lumbar vertebral body, with signs of nerve pressure but no cord involvement—a condition never in itself dangerous to life, though requiring mechanical treatment and real after-care to ensure recovery of satisfactory function.

Three cases, oddly enough, were fractures of the axis, without signs of cord lesion or of nerve pressure, but with very rigid necks in all three. Two were men, one a small boy of two years. All three were discharged in good condition with adequate mechanical support.

There were four neck fractures with cord damage.

Case 1. A boy of ten had fallen off a team on his head. He had a *loose* neck fracture, possible skull fracture, and so feeble a pulse as to preclude any chance of operation. He died within three hours.

Case 2. Aged 48. Was seen the next day after his fall. Symptoms had begun only the morning of admission,—numbness and weakness of arms. Neck tender and spastic. X-ray showed fourth cervical forward on the fifth. Three days later the paresis of arms was increasing. On the fourth day the luxation was reduced, apparently completely, under ether. Paralysis not improved. Died suddenly, absolutely without prodromal signs, next day.

Case 3. Sensation gone from waist down. Reflexes gone. Motor paralysis of legs complete, partial of both arms. Priapism present. X-ray showed fracture luxation of the 6th cervical forward on the 7th.

Laminectomy. Arches of 6th and 7th removed.

Motion in left arm improved and he recovered some motion in legs. Distended abdomen a serious factor, some vomiting. At five days his breathing became stertorous—the pulse failed gradually and he died.

Case 4. Fell down stairs. Fracture luxation of 4th on 5th cervical. Neurological examination by Dr. Knapp showed a crossed paralysis. Motor paralysis of right arm and leg. Analgesia and thermo-anaesthesia on the left with hyperaesthesia. Lesion unilateral, right, about the 6th segment.

Laminectomy—Cotton—at three days.

His sensation became normal and when discharged six months later he could walk without help and, despite contractures, had regained a good deal of power in the hand.

There were three cases of dorso-lumbar lesion.

Case 5. Boy of 19. Also had a skull fracture. Not seen until two weeks after injury. Obvious lesion just below dorsal lumbar junction. Retention urine. Total loss of power in left leg. Some in right leg. Reflexes absent. Sensation diminished on perineum, about buttocks and over outer sides of feet. Seen by Dr. Knapp before entrance; operation not advised. Ten days after I saw him, I could see no great improvement, and with Dr. Knapp's approval did a laminectomy, removing arches of the 1st, 2d, and 3d lumbar. After three weeks he began to improve slowly.

Now, after nearly a year, he can walk without support but has some loss of power in the peroneal muscles—some flexion contracture of one knee which is improving. There is some loss of sensation of sacral region. Sensation in perineum and sphincter power are normal. Improvement continues.

Case 6. Fell off roof. 60 feet. Usual picture of cord crush—probably total about the 8th dorsal.

Laminectomy—cord found completely crushed. After operation vomited and grew weaker. Died at four days.

Case 7. Fell four stories. Paraplegia, priapism, etc. Upper dorsal laminectomy three days later done because he began to lose power in arms. Died immediately after operation.

There is probably no definite moral to these cases, except what we have long known; first, that cases without cord lesions belong in a class of their own, that apparently total cord lesions, if operated on, should be treated merely as a justifiable gamble, with death certain the other way, and that cases of cord lesion, operated or not operated, have a disconcerting way of going to pieces slowly, or dying unexpectedly in no precise concord with our ideas of the pathology of the given cases.

Two cases of laminectomy given here show really worth-while results and should constitute a real argument for doing operations on the serious cases that obviosuly do not involve complete severing of the cord, in the absence of satisfactory improvement after a few days.

DISCUSSION.

Dr. E. A. Codman, Boston: I should like to take exception to one statement that Dr. S. J. Mixter made, and ask him if he would not modify it. I refer to Dr. Mixter's statement that anyone who considers his statistics in such operations is either a coward or a knave. My idea of the best possible surgeon in these cases would be the one who, if he did not believe the operation would be successful in his own hands, would get Dr. Mixter to do it. Dr. Mixter is in the position that he speaks of, but I do not feel that the rest of us are. A man who stands at the head of his profession here in Boston, and is president of the American Surgical Association, must operate on the very worst set of cases. Dr. Jason Mixter is in the same unfortunate position because he has had, at the Massachusetts General Hospital, one of the best opportunities to study fractures of the skull that any surgeon has ever had.

Personally, at any rate, I do not want to operate any case of skull fracture unless I am very sure that it is going to come out right. I should certainly consider my statistics unless both Dr. Mixter and his son are away on vacations.

Dr. E. R. Newton, Somerville: I should like to ask Dr. Cotton in regard to the cases with complete recovery in such a short time, what was the future outcome? In a few cases where they have apparently fully recovered, then we hear a few months afterward that they drop dead suddenly--wherein those cases of injury of the spine and skull do not give us good results. We ought to follow them up well and get the absolute end-results. I think that is a very valuable thing. I do not know where the time limit comes, but if a person dies some months afterwards and an autopsy is made, it is only with the knowledge of these cases that we can depend upon what the results were. Still, I do not think that may influence the question of operation, which seems to be the point here.

When you hit statistics you hit Dr. Codman. He is the statistician today of the surgical end of hospital work, and we all admire his work in that line. Statistics, however, may do as much injury as they do good. If you are handling an individual case and depending upon a lot of other cases you are sometimes led away from your individuality and your individual consideration of that particular case.

It seems to me also that Dr. Mixter hit a very nice point when he spoke of optimism and pessimism. A good deal does depend surely upon the individuality of the surgeon.

Discussion closed by **Dr. F. J. Cotton**: These were just a year's cases. I have no statistics, but I can say that whether you have bad skull fractures or minor ones, there seems to be a lack of tolerance to alcohol in these cases, after recovery, and the late end results are very largely influenced by that. That, of course, tends to invalidate any statistics.

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Clinical Department.

CHOLECYST-DUODENAL FISTULA.

By Edwin D. Gardner, M.D., New Bedford, Mass.

The following case of cholecyst-duodenal fistula seems of sufficient interest to be recorded:

F. H., female, 60 years old, single.

Family history. Negative.

Past history. Typhoid fever when a child. Has had four attacks similar to the present. First attack at age of 21. Last attack, nine years ago, was very severe, with much pain and high fever. Her physician at that time told her that she had pus in her gall-bladder and that it might rupture. She refused operation. Has had jaundice, chills, clay-colored stools and dark urine with all attacks. Past history otherwise negative.

Present illness. Seventy-two hours ago had very sudden and very severe pain under the right costal margin. Pain was constant and knife-like and radiated to the right shoulder blade, and also through to the back. Nauseated, and vomited dark green fluid repeatedly. No blood seen in vomitus. Bowels very constipated. Forty-eight hours ago became deeply jaundiced. Feces clay-colored and urine greenish in color. Twenty-four hours ago all pain stopped and jaundice began to clear up rapidly. Six hours ago pain came on again and patient is now having attack like first one, only less jaundiced.

Physical Examination. Skin and conjunctivae moderately jaundiced. Heart slightly enlarged but apparently compensated. Loud systolic murmur heard all over praecordia, loudest at apex, transmitted to axilla. Abdomen level, tympanitic throughout. No masses felt. No costo-vertebral tenderness. Kidneys and spleen not felt. Marked rigidity of the muscles on the right side of the abdomen, especially in upper quadrant. Spasm of muscles on left. Marked tenderness in the epigastrium and just below the right costal margin in region of gall-bladder. Could not feel any masses because of rigidity. No dulness in flanks. Liver dulness fifth rib to 1 cm. below costal margin.

Blood pressure 125. The urine was negative, except for the presence of bile. Stools clay-colored. White count 16,000. Temp. 101.6; pulse 100. Respirations 22. It seemed to me to be probably a cholecystitis and, because of the marked rigidity, I was afraid of empyema of the gall-bladder.

At operation I found a mass of adhesions in the region of the gall-bladder—adhesions tying up the liver, gall-bladder, stomach, duodenum and omentum. The gall-bladder was small and apparently mostly scar tissue and not particularly inflamed. Running from the fundus of the gall-bladder to the duodenum was a fistula about the size of a lead pencil, and embedded in the fistula, about one-half inch from the gall-bladder, was a stone about the size of a large pea. This I milked into the gall-bladder. The common-duct region was a mass of dense fibrous adhesions, so that it was hopeless to find the common duct. I felt that possibly the common duct was obliterated, so I did not think it wise to remove the gall-bladder and destroy the fistula. Drainage of the gall-bladder might mean a duodenal fistula, so I removed the two stones, and, as the gall-bladder apparently was not acutely inflamed, sutured it up tight, closing with great care. Immediately after the operation all went well. The temperature dropped to normal, the jaundice cleared up rapidly. On the fifth day the temperature rose to 100.4 and the patient complained of pain in the right chest. Examination showed a lobar pneumonia. An internist saw the case with me and agreed with my diagnosis, but also felt that there was fluid in the pleural cavity. X-ray showed a pneumonia on the right side but no fluid, and the diaphragm was pushed up on that side. Chest tap was dry. On the ninth day, the wound discharged profusely a thick, foul pus, which later became thin and excoriated the skin. This discharge kept up for about a month. It seemed to me that we were probably dealing with a sub-phrenic abscess and possibly a leakage through the gall-bladder and fistula. The patient finally convalesced and went home. I am not sure now but that I should have drained the gall-bladder.

At the end of a year after the operation she reports she has had two or three attacks of pain in the epigastrium, going through to the back; also pain in gall-bladder region, with nausea and vomiting. No jaundice. I saw her in one attack. Complained of severe pain. Temperature 100.6; pulse 80. Tenderness in the epigastrium and region of gall-bladder. No spasm and no masses. No jaundice. Stools and urine o. k. This attack lasted twenty-four hours. Feels perfectly well between attacks. The right diaphragm is still pushed up, the liver dulness being from the fourth rib to 1 cm. below the costal margin. The right lung is all right. There is slight bulging of the scar and the wall feels weak at this point, but there is no definite hernia as yet.

I wish to thank Dr. A. V. Pierce of New Bedford for referring the case to me.

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London Death Rates.—The death rate in London during the month of July, 1917, was 10.9, the highest rate being in the district of Southwark, which was 15.3; and the lowest rate being in the City of London district, which was 5.2. The lowest rate among the residential districts was 8.4 in Lewisham.

Harvard Medical School.

HARVARD MEDICAL ALUMNI FUND.

ELEVENTH ANNUAL REPORT FOR THE YEAR 1916

To the Contributors of the Harvard Medical Alumni Fund.

Dear Doctor:

During this last year alumni of the Harvard Medical School have contributed $3000 to the furtherance of clinical teaching in the School. By this action the alumni have actively promoted the clinical instruction of students in five departments: Medicine, Neurology, Obstetrics, Pediatrics and Surgery. The total sum thus far contributed to teaching through the Harvard Medical Alumni Fund during the ten years of its existence now amounts to $20,200, and the Permanent Fund has reached $9,088.16.

The Alumni Assistants during the year were as follows:

Dr. George P. Denny, 1912,
Alumni Assistant in Medicine.
Dr. Gilbert Horrax, 1913*
Alumni Assistant in Surgery.
Dr. F. M. Rackemann, 1912
Alumni Assistant in Medicine.
Dr. Lewis W. Hill, 1913
Alumni Assistant in Pediatrics.
Dr. George Clymer, 1911
Alumni Assistant in Neurology.
Dr. Raymond Titus, 1909
Alumni Assistant in Obstetrics.

* Johns Hopkins.

It is perfectly plain that this present school year, 1917-1918, will make great demands upon the Medical School because of increased cost of supplies. It is a year when the School most needs our help. Many of our contributors are at the front and they should not be asked for subscriptions; therefore, despite the heavy demands upon us all from many sources, it is upon us who are still at home that the burden of supporting the alumni teachers must fall. Not only must we give as before, but we must give as well for those who are at the front. Fortunately, it has been arranged that all expense of collection of the fund this year will be eliminated and every cent collected will go to an Alumni Assistant. We hope that the alumni will bear these facts in mind when they send their gifts to the Treasurer.

Please make checks payable to E. P. Joslin, Treasurer. Address: 81 Bay State Road, Boston.

FREDERICK C. SHATTUCK, *President*,
ELLIOTT P. JOSLIN, *Treasurer of Committee of Alumni Fund*,
MALCOLM STORER,
RICHARD C. CABOT.

FINANCIAL STATEMENT.
1916

	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
Amount subscription	$2,912.00	$1,975.00	$2,013.05	$2,109.00	$1,855.49	$2,364.14	$2,184.50	$2,217.50	$2,125.50	$2,173.10	$2,489.87
Int. on current funds	9.32	18.53	49.10	28.18	30.58	29.53	26.34	26.03	15.29	31.38	58.26*
Total yearly income	$2,921.32	$1,993.63	$2,062.15	$2,137.18	$1,886.07	$2,393.67	$2,210.84	$2,243.53	$2,140.79	$2,204.48	$2,548.13
Balance carried forward		1,415.79	807.08	847.00	899.58	679.15	564.37	476.41	504.84	581.89	547.57
Subscriptions paid in advance	....	....	....	....	....	107.00	116.00	24.00	10.00	98.00	186.00
	....	$3,409.42	$2,949.23	$2,984.18	$2,785.65	$3,179.82	$2,891.21	$2,743.94	$2,655.63	$2,884.37	$3,281.70
Applied for salaries	1,200.00	1,500.00	1,500.00	1,500.00	1,500.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	3,000.00
Applied for permanent fund		1,000.00	500.00	560.00	500.00	500.00	300.00	150.00	....	150.00	....
Expenses	305.53	22.34	102.23	24.60	106.50	115.45	114.80	89.10	95.74	88.80	82.89
Balance in bank	1,415.79	887.08	847.00	899.58	679.15	564.37	476.41	504.84	581.89	645.57	198.81
TOTAL	$2,921.32	$3,909.42	$2,949.23	$2,984.18	$2,785.65	$3,179.82	$2,891.21	$2,743.94	$2,677.63	$2,884.37	$3,281.70
Gifts to permanent fund	2,430.00	2,430.00	3,430.00	3,930.00	4,490.00	4,990.00	5,490.00	5,790.00	5,940.00	5,940.00	6,090.00
Int. on permanent fund		79.54	254.67	460.12	660.16	941.16	1,239.84	1,811.35	2,207.70	2,565.39	2,998.16
Addition to permanent fund ..	....	1,000.00	500.00	560.00	500.00	500.00	300.00	150.00	....	150.00	....
TOTAL permanent fund	$2,430.00	$3,509.54	$4,184.67	$4,950.12	$5,650.16	$6,134.16	$7,029.84	$7,751.35	$8,147.70	$8,655.39	$9,088.16
No. of contributors	295	276	260	251	226	384	361	344	357	325	332

* Includes interest for 1917, amounting to $27.43.

CERTIFICATION OF PERMANENT FUND.

Dr. E. P. Joslin,
81 Bay State Road, Boston.

Dear sir:

On April, 1917, the President and Fellows of Harvard College held $6,090 for the Permanent Fund of the Harvard Medical Alumni Association, with interest upon the same amounting to $2,998.16, making a total of $9,088.16.

Very truly yours,
(Signed) C. F. Adams,
Treasurer, Harvard College.

CERTIFICATION OF CURRENT FUNDS.

To the Trustees of
Harvard Medical Alumni Fund,

Gentlemen:

Owing to a misunderstanding, the books and accounts of your Treasurer for the year ended Feb. 28, 1917, did not reach me until today. I have now carefully audited them from the date of my last audit (March 22, 1916) to June 30, 1917.

I find the accounts carefully and accurately kept, all moneys received have been promptly deposited in bank, for all payments there are satisfactory vouchers on file and the same are properly entered on the Record Book.

Respectfully submitted,
(Signed) Geo. S. Chase, C.P.A., *Auditor.*

1842

*Taylor, O. B.
*Wellington, J. L.

1853

Storer, H. R.

1854

*Choate, David
Green, S. A.
Stone, L. R.

1855

Oliver, H. K.
*Wakefield, A. J.

1856

*Lamson, J. A.
*White, J. C.

1857

*Campbell, B. F.
Sprague, F. P.

1858

*Cheever, D. W.
*Derby, H.
Towar, G. W.

1859

*Heard, John T.
*Nichols, J. T. G.
*Shaw, H. L.
Wesselhoeft, W.

1861

Blake, J. G.
Edes, R. T.
Hubbard, C. T.

1862

*Clark, A. P.
*Wood, Albert
Wright, W. A.

1863

Cutler, E. R.
Driver, S. W.
*Greene, J. S.
*Hayden, D. H.
Perry, John G.

1864

Marcy, H. O.
*Robbins, N. A.

1865

Blake, C. J.
*Inches, C. E.
*Parsons, J. W.
*Wadsworth, O. F.

1866

Green, J. O.
Nichols, A. H.
Rice, C. H.
Warren, J. C.

1867

Kennedy, Geo. G.
Richardson, W. L.

1868

Borden, Sir F. W.
*Bowditch, H. P.
*Coggin, David
Elliot, Herbert
*Fitz, R. H.
Gay, G. W.
*Jelly, G. F.
*Pratt, H. J.
Quinby, H. M.
Wells, Frank

1869

*Draper, F. W.
*Goss, Francis W.
Shattuck, G. B.

1870

*Boutwell, H. T.
Farlow, W. G.
Hayes, S. W.
Putnam, J. J.
Spalding, J. A.
Wheeler, Leonard

1871

Blodgett, A. N.
Dixon, L. S.
Gordon, J. A.
*Spooner, J. W.
*Tinkham, G. W.

1872

Channing, Walter
Cutler, E. G.
*Fenwick, J. B.
Lovejoy, C. A.
*Mason, A. L.
Morton, W. J.
Woodbury, L. A.

1873

*Ayer, J. B.
Bradford, E. H.
Lawrence, R. M.
Porter, F. E.
Shattuck, F. C.

1874

Bigelow, W. S.
Davenport, F. H.
Emerson, E. W.
*Gerry, E. P.
*Rotch, T. M.
Thomas, F. S.
Williams, C. H.

1875

Dunn, W. A.
Nichols, C. L.
Stedman, Geo.
Stedman, H. R.
Whitney, W. F.

1876

*Cabot, A. T.
Huntington, T. W.
McCormack, C. J.
Putney, G. E.

1877

Bancroft, W. B.
Booth, E. C.

1877 (Cont.)

Daniels, E. A.
Everett, O. H.
Farlow, J. W.
Green, C. M.
Howe, O. T.
*Hutchinson, Marcello
Lopez, Rafael
Peters, E. D.
*Richardson, M. H.
Sheldon, C. C.
*Swift, J. B.

1878

Bacon, J. E.
Brannon, J. W
*Bryant, John
Comey, P. P.
Elliot, J. W.
Kilby, H. S.
Leland, G. A.
Mason, W. C.
Minot, J. J.
Morse, H. L.
Tuttle, G. T.
Walker, C. R.
Woodward, S. B.

1879

Bowditch, V. Y.
Bowers, W. P.
Broughton, H. W.
Hun, Henry
Mixter, S. J.
Prince, Morton
Swartz, G. T.
Wheeler, J. B.

1880

Briggs, E. C.
Dewey, C. A.
Grandin, E. H.
Jaques, H. P.
Pierce, M. V.
Ryder, Godfrey
Walton, G. L.

1881

*Harrington, F. B.
Manton, W. P.
*Swift, W. N.
Titcomb, G. E

1882

Allen, G. W.
Bigelow, E. H.
Buck, H. M.
Miller, G. N.
Morris, J. G.
Tuckerman, F.
Vickery, H. F.
Whitney, H. B.
Woodward, L. F.

1883

Baker, D. E.
Cheever, C. A.
Chisholm, A. S. M.
Cunningham, T. E.
Cutts, H. M.
Devine, W. H.
Foster, C. C.
Galloupe, C. W.
Guiteras, R.
Hewins, P. W.
Hodgdon, A. H.
Johnson, F. M.

1883 (Cont.)

Scofield, C. S.
Trumbull, John
Wetherell, A. B.
Wood, H. A.
Worcester, Alfred

1884

Brainard, J. B.
Conant, W. M.
Daniels, F. H.
*Gates, G. W.
Gifford J. H.
Harrower, David
Jackson, Henry
Kilburn, H. W.

1885

Boyd, S. G.
Brewer, G. E.
Faulkner H. K.
Knowles, W. F.
Louis, Isaac
Lovett R. W.
*Munro, J. C.
Munro, W. L.
Sears, G. G.
Swan, W. D.
*Talbot, Ambrose
Townsend, C. W.

1886

Baldwin, F. W.
Brackett, E. G.
Dodge, W. W.
Dunham, E. K.
Graves, C. B.
Greene, R. W.
Holcombe, C. H.
Howe, O. H.
Jack, E. S.
Mead, G. N. P.
Richards, G. L.
Tuttle, A. H.
Twitchell, E. T.

1887

Chase, H. L.
Clark, J. P.
Cowles, W. N.
Davenport, J. H.
Dunham, Carroll
Fallon, M. F.
Gage, Homer
Jacobs, H. B.
Kaufman, F. J.
Lilienthal, Howard
O'Meara, M. J.
Peters, J. M.
Sears, H. F.
Smith, H. L.

1888

Bryant, W. S.
Chandler, N. F.
*Cushing, E. F.
Eaton, P. J.
Gilman, W. R.
Harrington, T. F.
Pierson, E. L.
Prescott, W. H.
Sargent, G. A.
Scudder, C. L.
Stone, A. K.
Thorndike, Augustus
Thorndike, Paul
Trevino, M. F.
Walker, J. B.

1888 (Cont.)

Wenzlick, Wm.
Yocum, J. R.

1889

Abbott, H. P.
Bonney, S. G.
Chadbourne, A. P.
Clark, L. B.
Day, F. L.
Greenwood, Allen
Halpin, A. J.
Harding, G. F.
Hunting, N. S.
Lancaster, W. B.
Mahoney, S. A.
Morse, C. E.
Peterson, Reuben
Phippen, Hardy
Storer, Malcolm
Thayer, W. S.

1890

Bancroft, G. A.
Bell, R. M.
Carpenter, T. B.
Carroll, F. E.
Churchill, F. S.
Craigin, G. A.
Foote, E. M.
Goldthwait, J. E.
Holden, E. M.
Kenefick, J. A.
*Mumford, J. G.
Wilbur, H. G.
Young, C. D.

1891

Bartol, J. W.
Blake, J. B.
Crockett, E. A.
*Fourtin, E. R. P.
Fuller, D. H.
Huddleston, J. H.
Jelly, A. C.
Kingsley, W. L.
Knight, A. S.
Morse, J. L.
Percy, D. T.
Pratt, C. H.
Swan, W. H.
Taylor, E. W.

1892

Ames, J. L.
August, Albert
Balch, F. G.
Cabot, R. C.
Covell, H. H.
Craig, D. H.
Dane, John
Libby, J. H.
Lund, F. B.
Nichols, J. H.
Porter, C. A.
Towle, H. P.
Washburn, Eliot

1893

Abbott, E. S.
Baker, F. H.
Brewster, G. W. W.
Brown, P. K.
Goodale, J. L.
*Harlow, G. A.
Haskell, H. H.
Jones, C. P.
*Norton, Rupert

1893 (Cont.)

Phelps, J. S.
Piper, Frank
Steese, E. S.
White, C. J.
Yost, F. O.

1894

Allen, W. H.
Bottomley, J. T.
*Cabot, Follen
Chicoine, I. H.
*Cutler, James T.
Darling, E. A.
Fales, A. C.
Hoyt, E. M.
Houghton, H. L.
Keenan, H. J.
Lord, S. A.
Mix, C. L.
Moffit, H. C.
Page, C. G.
Reardon, T. J.
Richardson, M. W.
*Saville, S. C.
Shaw, A. J.
Stevens, C. B.
Swan, C. L.
*Webber, S. E.

1895

Baldwin, H. T.
Capps, J. A.
Chute, A. L.
Codman, E. A.
Cushing, Harvey
Denny, F. P.
Dudley, A. W.
Farnham, J. M. W.
Hall, Herbert J.
Holmes, E. M.
Joslin, E. P.
Marsh, A. W.
Miller, L. C.
Robey, W. H., Jr.
Smithwick, M. P.

1896

Cummin, J. W.
Drohan, J. H.
Ellsworth, S. W.
Frost, Horace B.
Greenough, R. B.
Howland, J. B.
Hubbard, J. C.
Jones, D. F.
Mac Isaac, J. A.
Newell, F. S.
Potter, N. B.
Schwab, S. I.
Spear, W. M.
Thorndike, Wm.
Torrey, J. P.
Washburn, F. A.
Young, E. B.

1897

Badger, G. S. C.
Briggs, C. E.
Broughton, A. N.
Daly, T. J.
Pearce, R. M.
Shea, J. J.

1898

Bailey, W. C.
Balch, A. W.
Beal, H. W.

1898 (Cont.)

Carey, F. H.
Collin, C. O. L.
Cutler, C. N.
Dearborn, S. S.
Donlan, Chas. E.
Donohoe, Geo.
Duckering, W. W.
Fischer, O. E.
Hudnut, P. A.
Hyde, Frederick T.
Kennedy, Harris
King, M. L.
Mackay, E. H.
May, W. R.
Mellus, Edw.
Moore, J. S.
Rose, W. H.
Stack, C. F.
Truesdale, P. E.
Walker, D. H.
Weil, A. I.
Weis, J. D.

1899

Allen, Freeman
*Churchill, Donald
Crane, C. C.
Davis, E. J.
Dix, G. A.
Dodge, A. M.
Greene, D. C. Jr.
Hammond, W. J.
Kepler, C. O.
Merriam, F. H.
Osgood, R. B.
Rose, A.
Tileston, Wilder
Wilkins, Geo. C.

1900

Bergin, S. A.
Brenneman, R. E.
Brown, Percy
Cannon, W. B.
Coolidge, Sumner
Cox, S. F.
Derby, G. S.
Dunn, C. H.
Eastman, A. C.
Emerson, R. L.
Fuller, C. B.
Griffin, W. A.
Hart, J. S.
Knowlton, J. G. W.
Lincoln, Merrick
Lord, F. T.
Lowell, F. L.
Lowell, W. Holbrook
McKibben, W. W.
Matteson, G. A.
Nightingale, J.
Norton, C. W.
Sanford, H. L.
Seelye, Walter C.
*Shepard, L. D.
Small, A. E.
Swift, H. M.
Taylor, J. D.
Wadsworth, R. G.

1901

Barrett, M. F.
Brady, J. F.
Bragg, L. R.
Breed, N. P.
Bremer, J. L.
Brewer, A. D.
Burley, B. T

1901 (Cont.)

Burnham, J. F.
Chase, A. A.
Chase, H. M.
Chase, W. G.
Cheever, David
Childs, A. H.
Crane, B. T.
Dutton, Richard
Emerson, Kendall
Flagg, Elisha
Hatfield, H. K.
Jackson, H. B.
Leen, T. F.
Locke, E. A.
Mason, N. R.
Mulherin, W. A.
Murphy, F. T.
Sanborn, G. P.
Sise, L. F.
Skarstrom, Wm.
Taylor, F. L.
Thompson, P. H.
Townsend, David
Underhill, S. G.
Walker, W. D.
Wood, N. K.

1902

Adams, C. S.
Barrows, A. A.
Bowditch, H. I.
Bufford, J. H.
Buffum, W. H.
Campbell, F. E.
Craigin, D. B.
De Normandie, R. L.
Ellis, R. H.
Emmons, A. B.
Evans, Albert
Feiss, H. O.
Feldstein, S.
Furrer, A. F.
Goodall, H. W.
Goodridge, F. J.
Hamilton, R. De L.
Hammond, R.
Hathaway, G. S.
Hodges, Fletcher
Hollister, R. R.
Hunt, E. L.
Kent, Bradford
Knowles, R. K. B.
Little, George T.
Mills, L. H.
Neilson, J. L.
Palfrey, F. W.
Prescott, H. D.
Sims, F. R.

1903

Adams, Z. B.
Bail, J. W.
Burrage, T. J.
Clark, G. O.
Cook, P. H.
Emery, W. C.
Fitch, R. R.
Floyd, C.
Gafney, H. D.
Hawes, J. B., 2d
Homans, John
MacLeod, W. P.
Oakman, C. S.
Parker, E. L.
Sargent, W. L.
Smith, H. B.
Stone, M. C.
Sullivan, E. C.

1904

Balboni, G. M.
Barney, J. D.
Bigelow, Edw. B.
Clow, F. E.
Cushing, A. A.
Cusick, L. F.
Clark, G. W.
Drowne, E. L.
Easton, C. D.
Fabyan, M.
Field, H. M.
Finkelstein, H.
Gray, C. P.
Hartwell, J. B.
Hatch, Royal
Hosley, W. A.
Howe, G. P.
Kahn, I. S.
Kidner, F. C.
Linenthal, Harry
Lloyd, H. D.
Marshall, H. K.
Mendelsohn, Louis
Oliver, E. L.
Place, E. H.
Phillips, J. C.
Phippen, W. G.
Robbins, W. B.
Russell, C. B.
Sears, E. P.
Seymour, Malcolm
Stanley, F. G.
Strauss, Sidney

1905

Adams, C. W.
Amsden, G. S.
Beach, S. J.
Blake, Gerald
Burnett, F. L.
Chace, F. A.
Chase, H. A.
Dana, H. W.
Day, H. F.
Dexter, Richard
Eastman, T. J.
Ehrenfried, A.
Fisher, Carl
Hoyt, C. W.
Lee, R. I.
Miller, M. D.
Morrill, G. N.
Ordway, Thomas
O'Shea, J. H.
Osgood, Geo.
Overlander, C. L.
Shattuck, G. C.
Sibley, B. E.
Stearns, R. S.
Talbot, F. B.
Whitney, J. L.

1906

Adamian, P. A.
Boothby, W. M.
Boyd, D. H.
Collins, A. N.
Crosbie, A. H.
Frothingham, C., Jr.
Gafforio, P. J.
Green, R. M.
Hamilton, F. A.
Kinnicutt, Roger
Ladd, W. E.
McGrath, B. F.
Mixter, C. G.
Mixter, W. J.
Richardson, E. P.
Risley, E. H.

1906 (Cont.)

Rowley, J. C.
Sawyer, W. A.
Sylvester, P. H.
Van Nuys, F.

1907

Brown, L. T.
Cahill, J. W.
Dailey, M. A.
Day, C. O.
Farnsworth, G. B.
Freese, J. A.
Hendricks, H. V.
Higginbotham, F. A.
Huntington, J. L.
Leake, J. P.
Long, A. D.
McDonald, C. A.
Peabody, F. W.
Pratt, M. R.
Sheahan, G. M.
Smith, R. M.
Spooner, L. H.
Stanwood, F. A.
Swift, W. B.

1908

Adler, H. F.
Edwards, M. R.
Hartshorne, Isaac
Keever, H. F.
Lane, C. G.
Lawrence, C. H.
Morrison, H.
Newburgh, L. H.
Smith, G. G.
Soule, W. L.
Swift, J. B., Jr.
Whittemore, W. S.

1909

Bowditch, Harold
Brigham, F. G.
Dennen, R. W.
Fitz, Reginald
Greeley, H. P.
Macomber, D.
Overlander, J. E.
Parker, Willard S.
Preble, W. E.
Reid, W. E.
Young, E. L., Jr.

1910

Barkan, Hans
Cutler, G. D.
Forbes, Alexander
Gamble, Jas. L.

1911

Austin, Richard S.
Bowers, G. F. H.
Clymer, George
Eustis, R. S.
Forbes, H. S.
Greenbaum, J. V.
Hornor, Albert A.
Jones, Ellis
Means, J. H.
Reynolds, R. L.
Smith, William David
Whidden, Rae W.

1912

Anderson, W. G.
Bell, R. D.
Hackett, L. W.
Lyman, Henry
Minot, Geo. R.
Rackemann, F. M.
Reggio, A. Wm.
Talbot, John E.
Woody, McIvor

1913

Blake, Francis G.
Buffum, W. P., Jr.
Cutler, E. C.
Denny, G. P.
Favill, John
Grinnell, F. B.
Hill, Lewis W.
Robertson, O. H.
Shapira, Albert A.
Strong, Seth L.
Wentworth, E. T.

1914

Binney, G. H.
Cobb, Stanley
Fernandez, M. J.
Gray, Horace
Lehman, E. P.
Levine, Samuel
Lunt, Lawrence K.
Lurier, Israel
Ohler, W. Richard
Richardson, H. B.
Solomon, H. C.

1916

Donation from Class.

* Deceased.

◆

Admittance of Women to Columbia Medical School.—The Medical School of Columbia University has decided upon the admittance of women in equal standing with men to its medical courses. This arrangement has been made possible by the gift of $50,000 from George W. Breckenridge of San Antonio, Texas. While the question of admitting women to the school has been under advisement for a long time, the decision was hastened by the altered conditions brought about by the war.

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Ernest Gregory, *Manager,*
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THE FREE DIAGNOSIS OF PATHOLOGICAL MATERIAL.

The State Department of Health announces in its Monthly Bulletin* the inauguration in Massachusetts of a service for the free diagnosis of pathological material. Such a service is already in successful operation in a number of other states, through the agency of the laboratories of State Universities or the State Departments of Health. In Massachusetts the service has been offered by the Cancer Commission of Harvard University, and the work will be under the supervision of Professor James Homer Wright, pathologist of the Massachusetts General Hospital, whose reputation is such as to secure the highest standard of scientific accuracy. Full details in regard to the shipment of specimens may be obtained from the district health officers of the state, and reports will be sent, in duplicate, to the health officer of the district, as well as to the physician who submits the material for diagnosis.

The larger hospitals of the state are, of course, supplied with pathologists and laboratory facilities competent to provide accurate pathological reports upon the tissues removed at operations. Outside of these hospitals, however, and especially in the case of poorer patients who cannot afford the fee for a private pathological examination, this measure of accuracy is too frequently neglected. The institution of a free diagnosis service will bring the advantages of such an examination within the reach of every resident of the state who consults a registered physician.

The most important aspect of this movement is in its application to the surgery of malignant disease, and it is largely in response to the recommendation of the American Society for the Control of Cancer, and of the Committee on Cancer of the Massachusetts Medical Society, that the work is undertaken in Massachusetts. The material submitted for examination will be derived chiefly from operations for the radical cure of carcinoma and sarcoma, and from less extensive operations for the removal of tumors and conditions which are clinically non-malignant, but which are known to possess possibilities of malignant change. While all tissues removed at operation should be subjected to examination, it is expressly stated in the announcement that the employment of these facilities for the diagnosis of small fragments of tissue removed by exploratory incision is not countenanced. The best surgical opinion of the present day absolutely condemns the incision into cancer tissue for the removal of a fragment for later microscopic diagnosis, on the ground that such a procedure is likely to lead to rapid spread of the disease. Only when facilities for immediate frozen-section diagnosis are available, and the radical operation, if it prove necessary, can be completed at one sitting, is such a measure even to be tolerated, and then only when all other resources of diagnosis have been exhausted, and the mutilation of the radical operation is so great as to outweigh the advantages of greater prospect of cure, when the exploratory incision is avoided.

Not a small part of the advantage of such a service will be the general increase in knowledge on the part of the laity, as well as of the medical profession, of the earliest symptoms of malignant disease. We may feel sure that another and an important step has been taken toward the much-to-be-desired control of cancer.

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* Quoted in another column of this issue of the Journal, page [illegible]

POLLENOSIS.

The reality of the condition known as pollenosis, or hay-fever, has been well established by experimental work in the field of immunization and treatment with pollen extracts. Although hay-fever is caused by the pollen of plant life, it is far from being a disease of the country, but is perhaps just as common in the cities. In all probability the urban community has a greater susceptibility owing to the adverse mode of urban life. The mongrel weeds found so widely distributed along the streets, open lots, backyards, etc., are potent factors in keeping the disease alive in the city. Chicago has recently undertaken a campaign of extermination against the stray weeds of the city, much as the city would undertake a campaign against any public nuisance or menace to health. The extent of the pollen nuisance was demonstrated in the City of Hamburg, by Liefmann, who found 250 pollen grains to the square centimeter. With the increased demand for garden planting there is less excuse for allowing weed plots that might be profitably converted into garden patches for the increase of the food supply.

Although the pollen grain is so widely distributed that the mucous membranes of every individual come in contact with it, only those who are susceptible contract the disease. The susceptibility to pollen infection increases generally with the lowering of the vitality, with nasopharyngeal disease or obstruction, with an increase in the amount of pollen inhaled—and, further, there seems to exist a hereditary sensitiveness to the disease in certain individuals. The spring variety of hay-fever is caused by the Graminaceae family of plants,—the autumn by the Compositae, especially the ragweed. More generally, hay-fever is caused by the pollen of flowers, various grasses, shrubs and even trees.

The disease is characterized clinically by an exudative catarrhal inflammation of the nasal, tracheal, bronchial and conjunctival mucous membranes, together with certain subjective symptoms. Hay-fever is a toxaemia; it is a hypersusceptibility to a foreign protein. The predisposition to this disease is due to an anaphylaxis established for these pollens. The toxin has a selective action upon the nerve cells, particularly upon the autonomous centers, producing an irritability in these centers, which in turn produce congestion in the erectile tissues of the nose, and in the allied mucous membranes, asthmatic symptoms, irritability of the motor areas, nervous excitation, destruction of mucous membrane, etc. When the pollen is brought into contact with the respiratory mucous membrane, either the pollen may be broken down into harmless products, such as proteoses and amino-acids, or the reduction process or cleavage by the mucous membrane may result in toxic proteins. But even the toxic cleavage in susceptible individuals may proceed so slowly that at no time are sufficient toxic proteins released to produce any symptoms, because the mucous membrane can take care of a certain amount of the pollen toxin. But in a suitable case the cleavage takes place rapidly and violently with the release of the specific enzymes and the production of the characteristic symptoms of the disease. Anaphylaxis may be established to a particular pollen or to a family of pollen-producing plants. The study of the specific vaccine treatment of pollenosis has brought to light the fact that the blood of affected patients or of animals used in experimentation contains amboceptors, precipitins and antitoxins.

The only form of treatment which promises any degree of success in pollenosis, is the vaccine treatment with pollen extract. Failures may be ascribed entirely to the fact that the pollen extracts used have not embraced any of the varieties of pollen that caused the anaphyaxis to the disease. The polyvalent pollen extract ordinarily used can no more be expected to reach every variety of pollen infection than polyvalent vaccines against bacterial infections. Usually, however, sensitiveness to the proteins of one pollen produces sensitiveness to the proteins of others of the same family, although not, of course, to the same extent. In practical work a combination of the Graminaceae and Compositae families reaches every indication. As in bacterial antitoxin work, the unit is the standard in immunization and treatment. The unit is an arbitrary factor determined as the quantity of pollen toxin that can be extracted from the thousandth part of a milligram of Phleum pollen. The strength of the pollen extract is determined by the number of such units contained in a cubic centimeter of extract. The extract is diluted before use to the required strength. The measure of resistance to the pollen toxicosis is determined by the number of units necessary to excite conjunctival reaction. As in all immunization work, the first effect is a lowering of the resistance the negative phase, followed soon by the increase or positive phase. Reactions are obtained either by instilling the extract into the eye, injecting it between or into the skin, or by the cutaneous route over a scarification. Usually, one-third the number of units necessary to produce the ophthalmic reaction is the dose for the prophylactic treatment, and ranges from 2 to 1,000 units. For therapeutic injections, one-tenth of the number of units giving the reaction are used. Of course, the ophthalmic test cannot be given in the active stage because of the inflammation, and the endermic or cutaneous tests must be used. The increase of the subsequent dosage depends upon subsequent reactions.

MEDICAL NOTES.

War Meeting of the American Public Health Association.—War and Health will be the central theme at the meeting of the American Public Health Association at Washington, D. C., Oct. 17-20. Some of the speakers on these subjects will be Surgeon-General Gorgas, U.S.A.; Surgeon-General Braisted, U.S.N.; Colonel T. H. Goodwin of the English Army; Assistant Surgeon-General J. W. Trask, U.S. P.H.S.; and representatives of the French and Canadian Sanitary Bureaus.

Each of the seven sections of the Association will have a conference on health problems and opportunities of the war, and a symposium on this subject will be given at one of the general sessions by committees from each section.

Mayors, boards of health, and others interested in sanitary science all over the country are invited to be present or to send representatives to the War Meeting. The Association emphasizes the necessity of obtaining hotel accommodations well in advance, as Washington will be crowded. Non-members are welcome.

The complete program has not yet been published, but will appear in the October number of the *American Journal of Public Health*, to be issued shortly before the meeting. Separate programs may be had by addressing the Acting Secretary, at 126 Massachusetts Avenue, Boston.

Although a large part of the meeting will be devoted to health problems of the war, about half the papers will be of non-military nature.

Following is a partial list of the papers to be presented:

Presidential Address, W. A. Evans, M.D.; Address, Surgeon-General W. C. Gorgas U.S.A.; Address, Surgeon General W. C. Braisted, U.S.N.; Address, Assistant Surgeon-General, J. W. Trask, U.S.P.H.S.; Address, Col. T. H. Goodwin of the English Army; Address, Franklin H. Martin, M.D., National Council of Defense; Address, Herbert C. Hoover (or a representative), Director U. S. Food Administration; War and Mental Diseases, Major Pearce Bailey, U.S.A.; Tuberculosis and the War, Dr. Hermann M. Biggs, State Health Commissioner, Albany, N. Y.; Report of Committee on Venereal Diseases, Dr. W. F. Snow, Member Advisory Council of Defense; Symposium—Venereal Disease Control in the Army and Navy; Rehabilitation of Injured and Crippled Due to the War, Major Joel E. Goldthwait, M.R.C.; Chairman's Address—Some Public Health Problems of the Present War, Dr. E. C. Levy, Chairman Public Health Administration Section; Chairman's Address—The Service of Health Laboratories in Time of War, Dr. Henry Albert, Chairman Laboratory Section; Sanitation of Barracks and Surrounding Zones—speaker to be announced; Rôle of the Local Health Officer in National Defense—speaker to be announced; Notification of Diseases and Protection of Troops, A. J. Chesley, M.D., Minneapolis, Minn.; General Measures for the Prevention and Control of Industrial Diseases in Time of War, Dr. Alfred Stengel; Need for Sanitary Supervision of Industries in Times of War, Dr. E. R. Hayhurst, Columbus, Ohio; Practical Points in the Safe Handling of T. N. T. and Allied Explosives, Dr. G. W. Hudson; Replacement of Men by Women in War Industries, Josephine Goldmark or Ida Tarbell; Industrial Fatigue, Its Relation to War Industries, Prof. Frederic S. Lee; War Activities of the Bacteriological Laboratories in France and England, Dr. William H. Park, Director of Research Laboratories, New York City; Canadian Laboratories in War Service, Dr. Nasmith, Director of Laboratories, Toronto, Ontario.

Poliomyelitis in New York State.—The town of Colton, St. Lawrence County, New York, has reported eleven cases of poliomyelitis. The schools and churches have been closed to children. No deaths have resulted as yet.

Gift of Mayo Hospital to University.—The period of affiliation of the Mayo Hospital with the University of Minnesota is at an end and the board of regents of the University have ratified by unanimous vote the permanent agreement making the Mayo Foundation at Rochester the absolute property of the University, to be used perpetually for higher medical education, research and investigation. Securities totaling $1,650,345, representing the fortunes of Drs. William J. and Charles Mayo, were turned over to the university. The expenses of the Foundation will be paid by the Drs. Mayo until a fund of $2,000,000 has accumulated, when the income will be sufficient to maintain the hospital. Under the terms of the agreement, the Foundation cannot be moved to another point in the state until after twenty-eight years.

American Association of Clinical Research.—At the annual meeting of the American Association of Clinical Research held in Boston, the following officers were elected for the coming year: President, Dr. Marshall William McDuffie; first vice-president, Dr. Roger M. Griswold, Kensington, Conn.; second vice-president, Dr. Joseph A. Woitz, Montpelier, O.; secretary-treasurer, Dr. James Krauss, Boston; registrar, Dr. Alonzo J. Shadman, Boston. The next annual meeting of the Association will be held in New York, during October, 1918.

WAR NOTES.

Appointment of Gastroenterologists to Base Hospitals.—The gastroenterological section of the American Medical Association will appoint thirty-two specialists in diseases of the stomach and intestines, who will receive commissions in the Army to serve in base hospitals of the United States.

Appointment of Baltimore Physician.—Dr. Arthur M. Shipley of Baltimore, professor of surgery at the University of Maryland, who had received his commission as chief of the surgical staff of the University of Maryland Base Hospital Unit, has been transferred by the War Department to Camp Meade, where he will become chief surgeon and surgical instructor at the camp.

Award of Victoria Cross.—It is announced that the Victoria Cross has been awarded to Temp. Captain Harold Ackroyd, M.C., for most conspicuous bravery. He was a student at Guy's Hospital and practised at Royston, Herts. Upon entering the service he was attached to the Royal Berks Regiment and was killed in action.

Medical Unit of American Women.—A mobile hospital unit composed entirely of American women, has been organized, and the French Government has accepted its services. Dr. Caroline Finley is director of the unit, which has the support of the National American Woman Suffrage Association. The work of the service will be principally among the women and children of the devastated districts of France, but in time of need it can be used to care for wounded troops. The unit offered its services to the United States Government, but, because women are not eligible to its medical corps, the offer was refused.

Appointment.—The appointment of Dr. Arthur True Ellison of Spencer, Mass., as first lieutenant in the United States Medical Reserve Corps, is announced. Dr. Ellison is a graduate of Middlebury College and of Tufts College Dental School.

Medical Expense of the War.—It has been estimated that the medical upkeep for each soldier of the army will be $25 for the first year. But this total of $25,000,000 for a million men is but a small part of the sum needed to finance the medical department of the army. Surgical dressings will cost $9,750,000; fabrics and textiles, $4,450,000; antiseptics and disinfectants, $3,400,000; motor ambulances, $6,840,000; medical and surgical instruments and appliances, $880,000, besides a wastage, including losses by sea of $16,671,000. Gas masks, trench sprayers and oxygen apparatus will cost $23,000,000. Every man on the front line will be provided with two masks and trained to put them on in six seconds. The standard type of motor ambulance adopted will cost about $2000 and will be heavier than the type previously used. It has been tried out on the border and in Mexico and has proved its satisfaction. The medical department has not been relieved to any great extent by the contributions of various organizations. The department has taken over ten base hospitals, but only four had equipment and that was valued at only $25,000 for each unit. Supplies are far short of what will be needed to equip the enlarged regular army alone. In order that they may be hastened, Surgeon-General Gorgas has been authorized to incur a deficiency for immediate preparatory measures to the amount of $29,000,000 over and above funds now in hand. Under that authority orders have been given to medical purchasing officers to make contracts and to place orders for large quantities of supplies, the exact cost of which it is impossible to estimate at the present time.

Red Cross Scholarships.—The town and county nursing service of the American Red Cross has received donations of money sufficient to establish a number of scholarships for the purpose of training women in public health nursing. The scholarships, of $250 each, cover an eight months' course at Columbia University, Simmons College, Western Reserve University, University of Cincinnati, and the School of Civics and Philanthropy, Chicago.

Americans in Charge of British Hospitals.—It is reported that six British hospitals will be put in charge of American doctors. They are at Manchester, Salford, Liverpool, Leeds, Birmingham and Cardiff, and at the first-named place eleven American doctors have been detailed. The British physicians thus released will return to civil practice. The sending of large numbers of physicians to the front has resulted in suffering among the civil population for the need of adequate medical attendance, and it is for this reason that American doctors have been assigned to take charge of the hospitals.

Assumption of Tuberculosis Work.—The trustees of the "Tuberculeux de la Guerre" have transferred their activities to the American

Red Cross. Major Grayson P. Murphy, head of the American Red Cross Commission to Europe, received, on behalf of the Red Cross, the property of the association and assumed control of the work. The property consisted of four sanatoria, about 1,500,000 francs, several automobiles and a large equipment of blankets, food and other materials for the use of patients suffering from tuberculosis. Major Murphy stated, in acceptance, that the great work for the control of tuberculosis in France would be carried on in conjunction with the plans of the Red Cross and the Rockefeller Foundation.

Honors for American Doctors and Nurses.—The French Hospital of New York, which has been operating a hospital in Yonne, France, since 1916, was honored recently by Justin Godart, under-secretary for the army medical service. Drs. John Irwin and Thomas Savage, who have served since the hospital was started, were presented with medals of public instruction. Other medals were given to nine of the nurses. The hospital is equipped with 250 beds, and is supported entirely by private funds. Mrs. William Fitzgerald of New York assumed its expense at first, but later it was taken over by Henry Walker of Baltimore.

War Relief Funds.—On October 6 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$265,031.02
Armenian Fund	235,269.06
Surgical Dressings Fund	134,819.06
Permanent Blind Fund	123,184.03
British Imperial Fund	109,911.00
Polish Fund	87,308.59
Italian Fund	44,543.72

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Sept. 29, 1917, the number of deaths reported was 230, against 238 last year, with a rate of 15.53, against 15.6 last year. There were 65 deaths under one year of age, against 52 last year.

The number of cases of principal reportable diseases were: diphtheria, 79; scarlet fever, 16; measles, 15; whooping cough, 24; typhoid fever, 9; tuberculosis, 67.

Included in the above were the following cases of non residents: diphtheria, 15; scarlet fever, 7; measles, 1; whooping cough, 2; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 3; typhoid fever, 1; tuberculosis, 15.

Included in the above were the following non-residents: diphtheria, 1; typhoid fever, 1; tuberculosis, 2.

Baby Hygiene Association.—During the month of August the Baby Hygiene Association cared for the largest number of babies in its history,—2682. This is 500 more than were cared for a year ago. A survey has been made of the City of Boston in the interests of child conservation which shows that added stations are needed for the Jamaica Plain and Upham's Corner districts. As soon as funds can be raised, these sections of the city will be provided with stations. The Lincoln House has offered the services of its dietitian to the Association to supervise a clinic for children between the ages of one and five years. This clinic will be opened October 1, and will care for the child up to school age,—a period which has had no medical or nursing supervision.

Suspension of Pay Clinic.—The Pay Consultation Clinic, which has been in operation at the Massachusetts General Hospital for some while, has been suspended for the time being. The war has caused such a shortage in the staff of the hospital that it has been found impossible to continue this Clinic longer. It is the intention of the Hospital to re-open the Clinic when conditions are more favorable.

Hospital Bequests.—By the will of the late Mrs. Augusta E. Corbin of Boston, the Massachusetts Homeopathic Hospital is the recipient of a gift of $100,000, the income to be used for general purposes, and the New England Deaconess Association is to receive the sum of $100,000 to erect and equip a building or extend buildings for hospital purposes, and the income of an additional $100,000 to be used for hospital work.

Graduation of Dental Hygienists.—The Forsyth Dental Infirmary has graduated a class of thirteen young women trained as dental hygienists. The class was established at the Forsyth Infirmary on October 2, 1916, in conformity with the Massachusetts registration law of 1915, which permits the employment of dental hygienists in public schools and institutions. Pupils are trained in the theory of dental practice, the sterilization and care of instruments, anesthetics and their exhibition, and the care of the patient before, during and after their administration.

New Quarters for State Health Department.—The State Department of Health has been moved from the third floor of the State House to the fifth floor of the west wing. The water and sewage laboratories will occupy adjoining rooms and the food and drug laboratories are on the same floor. The only division which will not be located on the fifth floor is the engineering division, which has been on the first floor for many years.

Tuberculosis Lectures at Framingham.—The Community of Health Station at Framingham has arranged with the Framingham Medical Club to give, during the winter, a course of lectures on tuberculosis. These lectures will constitute a thorough post-graduate course in this subject, and will bring to Framingham men who have become well known in tuberculosis work throughout the country. The first lecture was given on September 20 by Dr. William Smith, of the Harvard Medical School, who talked on "Differential Diagnosis in Tuberculosis."

The health station has recently been visited by Surgeon Major E. Rist of Paris, who is in America with the French scientific mission. After calling at the health station, Major Rist made a tour of Framingham, and will carry with him, for possible use among the French civilian population, as well as among French military forces, the methods employed here in the detection and treatment of tuberculosis and other preventable diseases.

Another visitor to the Health Station was Dr. H. A. Patterson of the National Association for the Study and Prevention of Tuberculosis, who is in coöperation with Washington authorities in the campaign for the detection of tuberculosis in the United States Army. Under his direction, arrangements have been completed with the military authorities for a thorough examination by tuberculosis experts of all men assigned to the different cantonments.

Women at Harvard Medical School.—Plans for the admittance of women to Harvard Medical School have been abandoned, for the present at least. The reason lies in the small number of women who made application, and the failure of all but one of these applicants to meet the necessary requirements.

Miscellany.

FREE DIAGNOSIS OF PATHOLOGICAL MATERIAL.

The State Department of Health takes pleasure in making the following announcement, made possible through the kindly offer of the Cancer Commission of Harvard University.

On and after October 1, 1917, with the coöperation of the Cancer Commission of Harvard University, the State Department of Health of Massachusetts will be able to offer to the registered physicians of the State the opportunity for the free diagnosis of pathological material removed at operation. This service is already provided in a number of states by the laboratories of state universities or by the departments of public health. It is believed that a material decrease in the number of advanced and inoperable cases of cancer, and a considerable increase in the accuracy of diagnosis of cancer and other tumors, will result from the institution of this service.

Specimens submitted for examination will be received at the laboratory of the Cancer Commission, at the Medical School of Harvard University, Longwood Avenue, Boston. This service will be under the direction of Prof. James Homer Wright, M.D., S.D., pathologist of the Massachusetts General Hospital. Reports will be forwarded by mail or telegram to the attending physician.

The practice of cutting through sound tissue into cancer tissue in order to remove a fragment for subsequent microscopic examination is generally condemned, on the ground that such a procedure leads to a rapid spread of the disease and usually deprives the patient of his one chance of cure by radical operation. When doubt exists as to the nature of a tumor which is deeply placed, after all other resources of diagnosis, such as the x-ray, the Wassermann reaction, the blood examination, and competent consultation, have been exhausted, the resources of some hospital or institution equipped for immediate frozen section diagnosis should be sought, and the operation should be completed under one anesthesia. Thus lesions which are suspected to be malignant may be divided arbitrarily into two groups, as follows:

Group 1. Lesions which are superficial or ulcerated, as those of the external skin, the mouth, tongue, palate, larynx, esophagus, rectum, bladder and cervix of the uterus. In such cases the whole lesion should be removed in preference to cutting into the suspected tissue. Where total removal would cause so much mutilation as to be unjustified on a doubtful diagnosis, facilities for a frozen diagnosis should be obtained in order that the radical operation may be completed immediately if malignant disease is discovered. The cautery should be used in these cases to seal the lymphatics while waiting for the report of the pathologist. This caution applies also to suspected carcinoma of the body of the uterus, and immediate frozen section diagnosis of the material obtained with the curette should be made available, and the radical operation, if necessary, performed under one anesthesia. In but few cases is the exploratory removal of a fragment of tissue to be sent for a subsequent pathological examination justified. When no other recourse is open to the physician, however, the specimen should be removed with the cautery, or the cautery should be used immediately to seal the tissue spaces.

Group 2. Lesions which are deeply placed, and covered by sound tissue, as those of the breast, the salivary glands, thyroid, stomach, intestine, gall bladder, kidney, ovary, testicle and tumors of the subcutaneous tissues, lymph nodes, bones, fasciae and muscles. In such cases the exploratory incision into the suspected tumor tissue is *never* justified unless the frozen section diagnosis is available, and even then the radical operation, without exploratory incision is usually safest for the patient. Especially is this true in the case of tumors of the breast.

Benign tumors and diseases which are recognized as particularly liable to malignant development should be removed entire, and the tissues submitted for confirmation of the diagnosis by pathological examination. Among these conditions may be included the benign tumors and chronic diseases of the breast, ovarian cysts, papillomata of the rectum and anus, polyps of the uterus, rectum and larynx, and pigmented moles, naevi, warts, fissures and chronic ulcerations of the external skin, especially those which show a tendency to ulceration, bleeding or gradual increase in size.

Containers and full directions for the preservation and shipment of specimens for diagnosis may be obtained from the State District Health Officer. These officers are stationed as follows:

Dr. Adam S. MacKnight, 355 North Main Street, Fall River.

Dr. Merrill E. Champion, 50 Phillips Street, Wollaston.

Dr. Arthur A. Brown, Willey House, Swampscott.

Dr. Charles E. Simpson, 100 Holyrood Avenue, Lowell.

Dr. George T. O'Donnell, 768 Main Street, Waltham.

Dr. Francis A. Finnegan, 14 Longwood Avenue, Fitchburg.

Dr. John S. Hitchcock, 160 Main Street, Northampton.

Dr. Howard A. Streeter, 740 Dalton Avenue, Pittsfield.

A card will be provided which must be filled out by physicians desiring to avail themselves of this service. Reports will go in duplicate to the physician and to the health officer of the district, and any questions raised by the pathological report will be discussed by letter or by personal interview with the Director of the State Diagnosis Service during his office hours, Monday, Wednesday and Friday, 4 to 5 p.m., Cancer Commission, Medical School of Harvard University, Building E, Longwood Avenue, Boston.

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CANCER DECALOGUE PREPARED BY THE STANDING COMMITTEE ON THE CONTROL OF CANCER OF THE MASSACHUSETTS MEDICAL SOCIETY.

1. The classical signs of cancer are the signs of its incurable stages. Do not wait for the classical signs.

2. Early cancer causes no pain. Its symptoms are not distinctive, but should arouse suspicion. Confirm or overthrow this suspicion immediately by a thorough examination and, if necessary, by operation. The advice, "Do not trouble that lump unless it troubles you," has cost countless lives.

3. There is no sharp line between the benign and the malignant. Many benign new growths become malignant and should, therefore, be removed without delay. All specimens should be examined microscopically to confirm the clinical diagnosis.

4. Precancerous stage. Chronic irritation is a source of cancer. The site and the cause of any chronic irritation should be removed. All erosions, ulcerations, and indurations of a chronic character should be *excised*. They are likely to become cancer.

5. Early cancer is usually curable by radical operation. The early operation is the effective one. Do not perform less radical operations on favorable cases than you do on unfavorable ones. The chances for a permanent cure are proportionate to the extent of the first operation. Make wide dissections; incision into cancer tissue in the wound defeats the object of the operation and leads to certain local recurrence.

6. Late cancer is incurable, though not always unrelievable. Radium, x-rays, ligation, cautery, or palliative operations may change distress to comfort and may even prolong life.

7. Cancer of the breast. All chronic lumps in the breast should be removed without delay. Benign tumors can be removed without mutilation. Examine all specimens microscopically. An *immediate* microscopical examination is desirable since, if positive, it permits a radical operation at the same sitting. A radical operation performed ten days after an exploration is almost never successful in curing cancer of the breast.

8. Cancer of the uterus. Any irregular flowing demands thorough investigation. Offensive or even very slight serous flows are especially suspicious. Curette and examine microscopically. Amputate all eroded cervices which do not yield promptly to treatment. Do not wait for a positive diagnosis.

9. Cancer of the digestive system is difficult of early diagnosis, and therefore unfavorable in prognosis. All persistent and recurring indigestions (more especially if attended by change of color and loss of weight) and any bleeding or offensive discharges demand prompt and thorough investigation. Do not wait for a positive diagnosis.

10. Cancer of the skin. Any warts, moles, or birthmarks which enlarge, change color, or become irritated, should be removed promptly. They are likely to become cancer. Do not wait for a positive diagnosis.

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RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS, FOR AUGUST, 1917.

GENERAL PREVALENCE.

There were 3,176 cases of communicable diseases reported during August, a marked decrease as compared with the total of 4,600 cases reported for July. In August, 1916, 3,172 cases were reported.

Diphtheria, pulmonary and non-pulmonary forms of tuberculosis show an increase in the State, compared with August, 1916.

Customarily, the incidence of diphtheria should decrease from July to August, but this year it remains practically stationary, 597 cases being reported in July and 592 in August.

Anthrax.—Two cases of anthrax were reported. One, confirmed bacteriologically, was a freight handler who had presumably been handling raw hides from South America. The other case was an embosser of finished leather. Laboratory results were negative, but the use of antiseptic solutions may have interfered with the tests. Smears and cultures of suspected anthrax cases should be taken at once, before treating, to insure finding the anthrax bacilli.

Smallpox.—One case of smallpox in Ware was a travelling salesman who had been in Connecticut and Worcester, Massachusetts, a short time before the onset. The patient was vaccinated in 1902, and the case was very mild. There were no cases reported from Worcester in August.

Cerebrospinal Meningitis.—There were 19 cases of this disease reported, a larger number than usual for August. The cases were all scattered, no locality reporting more than 2 cases except Boston, where 4 were reported.

Poliomyelitis.—The danger of an epidemic of this disease is now practically over, as only 39 cases were reported during August, an increase of 1 case over July. The only unusual prevalence of the disease was in Haverhill where 20 cases were reported.

Diseases on the Premises of Milk Handlers.—During the month, 2 cases of typhoid fever, 5 cases of septic sore throat and 2 cases of diphtheria occurred in families of milk handlers.

EPIDEMICS AND OUTBREAKS.

Dysentery.—During July and August 75 cases of dysentery occurred at the Grafton State Hospital, 45 being in the Worcester Department with 3 deaths, and 30 in the Grafton Colony, the cases being confined to two buildings.

The cases in the Worcester Department were confined to the inmates, but in the Grafton Colony two nurses and two staff physicians had the disease.

The disease was characterized with a sudden onset, fever, abdominal pain, frequent copious watery stools occasionally accompanied with blood and mucus, heavy white coated tongue. The duration of the attack averaged four days.

Laboratory examinations failed to disclose any amebae or known strains of Bacilli Dysenteriae. No milk or food handlers were sick, and the source of the outbreak was not determined.

Typhoid Fever.—An epidemic of 54 cases occurred in Gardner due to a carrier on a milk farm.

Streptococcic Sore Throat.—An epidemic of streptococcic sore throat occurred during the first week of August in Natick, Wellesley and Dover. There were 119 known cases of the disease and two deaths, due to streptococcic septicemia.

Attention was first called to the presence of an epidemic by a patient developing a peritonitis and the finding of hemolytic streptococci in the peritoneal fluid.

An immediate investigation showed the majority of the cases to be on the route of one distributor who was supplied by three farms, the C., H. and M. farms.

The investigation showed the presence of hemolytic streptococci in the throat of two milk handlers on the C. farm, and in the throat of one of the milk distributor's family. Streptococci were also found in the throat of a milk handler working for the distributor, but the hemolytic character of the organisms was not determined.

Also one cow on the C. farm was found to be discharging large numbers of non-hemolytic streptococci.

The epidemic was stopped by the isolation of all known cases on the farms, sterilization of milk utensils, pasteurization of milk and the elimination of the cow shedding streptococci from the herd.

RARE DISEASES.

Anterior Poliomyelitis was reported from Acton 1, Boston 1, Brockton 2, Fall River 1, Haverhill 20, Hingham 1, Lowell 1, Lynn 2, Marlboro 1, Natick 2, Northampton 1, Saugus 1, Stoneham 2, Winchendon 2, and Worcester 1.

Cerebrospinal Meningitis was reported from Barnstable 1, Boston 5, Fall River 1, Gloucester 2, Lawrence 1, Lowell 2, Lynn 1, New Bedford 2, Peabody 1, Pittsfield 1, Somerville 1, and Springfield 1.

Dog-bite was reported from Chelsea 1, Lowell 1, and Waltham 1.

Dysentery was reported from Boston 39, Fall River 2, Greenfield 5, Newton 1, and Peabody 1.

Glanders was reported from Tewksbury 1.

Malaria was reported from Boston 2, Brookline 1, Cambridge 1, Danvers 1, Dedham 4, Foxboro 1, Medfield 1, Milford 1, and Northampton 1.

Pellagra was reported from Boston 1, Danvers 1, Peabody 1, and Tewksbury 1.

Septic Sore Throat was reported from Boston 6, Dover 1, Natick 26, Newton 1, and Wellesley 2.

Smallpox was reported from Ware 1.

Tetanus was reported from Brockton 1, Dennis 1, New Bedford 1, Peabody 1, Springfield 2, Westfield 1, and Winchester 1.

Trachoma was reported from Boston 5, Brockton 1, Lynn 1, Peabody 1, and Worcester 2.

Trichinosis was reported from Boston 1.

Correspondence.

A LAY DESCRIPTION OF DIABETES.

Prouts Neck, Me., Sept. 27, 1917.

Mr. Editor:

The following is from Bazán's "The Swan of Villamorta," and interestingly describes the sensations of Don Victoriano Andres de la Comba, a Spanish statesman.

"His words were a monologue, the spoken utterance of the gloomy thoughts which Don Victoriano—thanks to heroic efforts!—had hitherto been able to conceal in his breast.

"The strange malady from which he suffered gave rise to horrible nightmares. He dreamed he was turning into a loaf of sugar and that his intellect, his blood, his life were flowing away from him through a deep, deep channel, converted into syrup. In his waking moments, his mind refused to accept, as one refuses to accept a humiliation, so strange a malady. Sanchez del Abrojo must be mistaken; his was some functional, transitory disorder, an ordinary ailment, the result of his sedentary life, and Tropiezo's old-fashioned remedies would, perhaps, after all, prove more efficacious than those of science.

"And if they did not? The statesman felt a cold chill run through him that made his hair stand on end and constricted his heart. To die when he was scarcely past forty, with his mental powers unimpaired, with so many things begun, so many accomplished! And, no doubt, this consuming thirst, this insatiable voracity, this debilitating sensation of melting away, of fusion, of dissolving, were all fatal symptoms."

It is seldom that one finds in fiction so vivid, and at the same time so accurate, description of the symptoms of disease as this thumb-nail sketch of diabetes by Bazán.

Yours truly,

William Pearce Coues.

NOTICE.

Censors' Examination.

The Censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at 8 The Fenway, on Thursday, Nov. 1, 1917, at 4 p.m.

Candidates, who must be residents of Suffolk District or non-residents of Massachusetts, should make personal application to the Secretary, and present their medical diplomas, at least three days before the examination.

For further particulars, apply from 2 to 4 p.m. to

George Gilbert Smith, *Secretary*.

99 Commonwealth Avenue.

RECENT DEATHS.

John Bernard Donnelly, M.D., a Fellow of the Massachusetts Medical Society, died at his home in West Gardner, August 2, 1917, aged 50 years. He was a graduate of Holy Cross College in 1890, and of the Harvard Medical School in 1893.

Moses Greeley Parker, M.D., a retired Fellow of the Massachusetts Medical Society, died in Lowell, October 1, 1917, aged 74 years. He was a native of Dracut, the son of Theodore and Hannah Greeley Parker, and graduated from Harvard Medical School in 1864, having been assistant surgeon to the Fifty-Seventh Massachusetts Infantry during the Civil War. He made a specialty of diseases of the eye and ear, was visiting physician at St. John's Hospital for 30 years, and a trustee of the Lowell General Hospital up to the time of his death. He was always much interested in the telephone business and in patriotic societies.

Harry Vernon Weaver, M.D., died at his home in New Bedford, September 21, 1917, aged 47 years. He was a graduate of Boston University School of Medicine in 1893, practised ophthalmology, otology, laryngology and rhinology and was a Fellow of the Massachusetts Medical Society and also of the Rhode Island Medical Society.

MARRIAGE.

Dr. Frederic O. West of Woburn Mass. was married recently to Miss Gretchen R. Van Tassel, also of Woburn. Dr. West is a graduate of Harvard Medical School, class of 1908.

SOCIETY NOTICES.

Middlesex East District Medical Society.—A regular meeting of the Middlesex East District Medical Society will be held at the home of the president, Dr. H. A. Gale, Winchester, on Wednesday, Oct. 17, 1917, at 8 p.m. The general topic of the meeting will be Obstetrics.

H. B. Jackson, M.D., *Acting Secretary.*

Worcester District Medical Society.—A regular meeting of the Society was held Wednesday, October 10, 1917, at 4.15 p.m. in G. A. R. Hall, 55 Pearl Street, Worcester.

Program.

1. Principles and Problems of So-called "Health Insurance," Dr. Walter P. Bowers, of Clinton.
2. Discussion.

The Censors meet for the examination of candidates for Fellowship at 4.00 p.m., Thursday, Nov. 1, 1917, in the reference department of Worcester Public Library. Applicants should secure blanks from the Secretary, fill out and file with him on or before Oct. 25. It is also necessary to present diplomas for verification on or before the examination day. The examination is oral.

Revised list of physicians in Military Service of the United States or the Allies.

U. S. Army: Dr. Joseph O'Connor, Worcester; Dr. Howard Beal, Worcester; Dr. Edw. B. Bigelow, Worcester; Dr. Frank W. George, Worcester; Dr. Roger Kinnicutt, Worcester; Dr. E. B. Simmons, Worcester; Dr. William E. Denning, Worcester; Dr. Willard Lemaire, Worcester; Dr. James J. Goodwin, Clinton; Dr. Chester C. Beckley, Lancaster; Dr. Roger Schofield, Worcester; Dr. Merrick Lincoln, Worcester; Dr. George Lincoln, Worcester; Dr. E. S. Phelan, North Brookfield; Dr. R. S. Newton, Westboro; Dr. William J. Fay, Worcester; Dr. A. K. Yoosuf, Worcester; Dr. James V. May, Worcester; Dr. Gilbert Haigh, Worcester; Dr. Samuel C. Gwynne, Worcester; Dr. William N. Stapleton, Worcester; Dr. Harry P. Cahill, Worcester; Dr. Israel Lurier, Worcester.

U. S. Navy: Dr. Louis Johnson, Worcester; Dr. Thomas Courtney, Worcester; Dr. Joseph L. Lannois, Northboro; Dr. Winthrop Adams, Worcester.

English Army (Harvard Unit): Dr. Kendall Emerson, Worcester; Dr. Oliver Stansfield, Worcester; Dr. Stanley Bridges, Worcester; Dr. George Watt, Worcester.

English Hospitals: Dr. Albert O. Raymond, Worcester; Dr. William H. MacKay, Worcester.

The secretary is in receipt of a letter from Dr. Edw. H. Mackay, stating that the inclusion of his name in the Army list last month was an error.

The Medical War Committee invites information to supplement or correct this list. Doctors joining the Colors should notify the committee and indicate their wishes with regard to sharing the fees derived from their patients.

Ernest L. Hunt, *Secretary.*

The Boston Medical and Surgical Journal

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Medical Progress.

PROGRESS IN TUBERCULOSIS: A COLLECTIVE ABSTRACT OF IMPORTANT ARTICLES PUBLISHED DURING THE YEAR 1916.

By John B. Hawes, 2d, M.D., Boston,

and

P. Challis Bartlett, M.D., Boston.

There is so much written on the subject of tuberculosis every year that only the more striking articles and, naturally, those that, in our opinion, were of special importance can be mentioned, and these only briefly. A fairly complete list of references will enable anyone who wishes to go further into the subject to do so without difficulty. The articles reviewed naturally fall into two groups,—those dealing with tuberculosis in adults and those dealing with children, with various subdivisions in each group.

Tuberculosis in Adults.

Early Diagnosis.

It is evident from the articles on this subject that the importance of early diagnosis is coming to be more clearly recognized than ever, and especially the difficulties involved therein. Special tests are of value, but time, patience, and common sense are above all other factors in importance.

Farris[17] emphasizes the fact that early diagnosis is absolutely essential, but that it takes patience and painstaking skill to make such diagnoses properly. He reviews the details necessary in this work and mentions those special procedures to which he attaches importance.

Probst,[53] discussing why early tuberculosis is so frequently not recognized, believes that it is because of ignorance, cowardice, or carelessness on the part of the patient, or on the part of the physician. He makes a plea for a special professorship of tuberculosis in our medical schools, and urges further study of the subject.

Fishberg[19] urges conservatism in making early diagnoses. From the social and economic standpoint, a diagnosis of tuberculosis is a serious affair. It is a traditional fallacy that every case of tuberculosis, if taken in time, can be cured. He believes that there are many nontuberculous patients in our sanatoria. The stigma of tuberculosis is a serious matter. Suspects should be kept under observation and not immediately rushed off to a sanatorium.

Perkins[49] discusses the various conditions that may present symptoms of tuberculosis and lead to errors in diagnosis. He protests against the common practice of calling all these patients tuberculous on the ground that they may be so, and that in any event treatment as such will do them good.

Hawes[27] urges that each patient suspected of having pulmonary tuberculosis be treated as an individual, and not diagnosed as such according to any routine standard. Constitutional signs and symptoms are of more importance than signs in the lungs. The diagnosis must not be hurried, nor must the physician make up his mind beforehand as to the diagnosis. The early diagnosis requires patience, perseverance, boldness, and, above all, common sense.

Abrahams[1] reviews carefully and in detail the symptoms of incipient tuberculosis and the finer points of auscultation and percussion. He believes (and many will agree with him) that the microscope and the x-ray are more ornamental than useful in this stage of tuberculosis, and frequently delay treatment by their negative results.

Dutton[15] emphasizes the amount of care and skill required to make a correct diagnosis of early tuberculosis. He makes the remarkable statement that percussion is of no value, and that the ear alone is better than the stethoscope. He makes an urgent plea for early diagnosis, but many of his statements would hardly bear analysis.

Gilbert[24] discusses early diagnosis and the various special tests now available to help in such diagnosis. He depends more on the results of careful, detailed history-taking and examination than on any special tests.

Parfitt[48] calls attention to those cases in which the diagnosis of tuberculosis is evident, but in whom some other process is of more importance. Among other conditions, he mentions chronic bronchitis, sinusitis, bronchiectasis, rhinitis, and other conditions of the respiratory tract; complications elsewhere, such as appendicitis, pelvic disorders, and other pathological abdominal conditions, may be of still greater importance.

Barber,[5] discussing the early diagnosis of tuberculosis as it relates to the Navy, finds a discouragingly small decline in the incidence of this disease during the past seven years. It is in the recruiting service that the first steps must be taken to reduce this high incidence. The presence of tubercle bacilli in the sputum is not an early sign, and is no longer a requisite for diagnosis.

Hawes,[28] basing his conclusions on a comparative study of the results of 700 consumptives diagnosed by Massachusetts physicians in 1912, and the results of diagnosis in a similar series in 1915, is able to show distinct improvement in diagnosis and, especially, a great increase in the number of patients who underwent examinations as a routine and before they suspected that they had consumption. Even as late as 1915, however, out of 500 patients, over 50% were not made to understand that they had consumption.

Kahn[31] discusses newer laboratory methods in the early diagnosis of tuberculosis, and comments briefly on their value. The various tests relating to sputum, such as the presence of albumen, ferments, salicylic acid and glycogen tests, he finds of little value; the Arneth classification is too elaborate and the complement-fixation test still in its experimental stage.

Hamblet and Barnes[26] have made an extensive study of the sputum of sanatorium patients, especially those with sputum negative to tuberculosis, with a view of determining how far influenza simulated tuberculous processes in these patients. From a study of 300 sanatorium patients, extending over four years, they find no evidence that influenzal bronchitis frequently simulates or complicates pulmonary tuberculosis.

Lord[37] reviews 549 cases of hemoptysis. Pulmonary tuberculosis occupies first place as a cause; chronic passive congestion, second; and lobar pneumonia, third. Other causes were infarct, aneurysm, new growths, and abscess.

Blaine,[7] discussing the value of the x-ray, states that this method occupies no niche of infallibility, nor does it displace other physical signs; it must be considered with them. He believes that there are signs obtainable by means of x-ray examination which, when taken together and carefully considered, enable us often to diagnose incipient tuberculosis before it can be determined by any other method. Many would consider this too sweeping an assertion.

McCrae and Funk[39] describe in detail five cases of apical bronchiectasis. Tuberculosis was associated in four of these cases. They discuss in detail the difficulties of diagnosis. It might well be imagined that in those cases associated with tuberculosis a diagnosis during life of apical bronchiectasis was not only difficult but impossible.

Lapham[35] urges the importance of the study of tuberculous bronchial glands as the original focus of a subsequently developing pulmonary tuberculosis. She discusses the diagnosis of this condition, and advises no doctor to state that a child's lungs are negative simply because he can find no evidence of pulmonary involvement.

Treatment.

Townsend[60] sums up the advantages of early sanatorium treatment as follows: (1) Careful supervision by experts. (2) Reduction of cost to patient and to the community. (3) Formation of new, healthy habits, and character. (4) The creation of missionaries who spread the gospel of right living in the community in which they live.

Rockhill[54] believes that sanatorium treatment is far superior to home treatment of consumptives and, further, that climate plays only a very small part in the treatment. Judicious teaching of the patient is a necessary part of the treatment of tuberculosis.

Bay[6] discusses that most difficult of all problems that superintendents of large state and city sanatoria have to meet, i.e., that of getting the patients to work, so that they are mentally and physically equipped to take up some occupation after leaving the sanatorium. The article is of distinct interest and value.

Minor[44] urges the use of judgment and common sense in employing rest and exercise in the treatment of pulmonary tuberculosis and the avoiding of extremes in either direction. The guides in this are temperature, pulse, cough, and expectoration, weight and fatigue.

Frazer[21] believes that a thorough knowledge of the principles of rest and exercise must underlie the treatment of tuberculosis. Rest and exercise must be carefully prescribed, after due consideration of all symptoms. Exercise is to be increased only very gradually.

Fish[18] discusses climate and tuberculosis in a sensible manner and urges that every factor—financial, temperamental, and physical—be considered before sending a patient away. "There is no one best climate for all cases," he wisely observes.

Mills[43] discusses the question of climate and tuberculosis from the general point of view of: (1) the physical condition of the patient, (2) the economic circumstances, (3) the place to send him. He is an enthusiastic believer in the climate of New Mexico and western Texas as being the best in most cases.

Pottenger[51] discusses the treatment of various forms of cardiac weakness in tuberculosis. Although he mentions the use of digitalis, caffeine, and other drugs, rest in bed is the most important factor in the treatment of this condition. This he wisely emphasizes.

Shortle[58] describes the widely varying methods of treatment of pulmonary hemorrhage and his own way of handling this complication. Mental and physical rest is essential. Inhalation of chloroform to lower blood pressure, followed by injection of pituitary extract for the same purpose, is then given. Codeine is better than morphine. Epsom salts are freely given, and gelatin is given three times daily.

Browning[11] calls attention to the part played by diseased and carious teeth as foci of infection and portals of entrance in tuberculosis work, and urges that adequate attention be paid to the teeth of all children.

Bonime,[9] evidently an enthusiastic believer in tuberculin, states that he is convinced that in tuberculin we have a positive agent in the cure of tuberculosis, and especially in non-pulmonary disease. Like all enthusiasts, he goes too far and claims too much.

Brosamlen[10] measures the improvement his patients make under treatment with tuberculin by the increase in the number of eosinophiles in the blood after an injection. It might be taken for granted that simpler and safer methods of noting improvement are usually available.

Arkin and Corper[2] fail to find reliable evidence to prove that arsenic has a specific action against tubercle bacilli.

Gardner[23] believes that heliotherapy is now on a firm scientific basis and that, if used with caution and patience, it will prove of value, not only in non-pulmonary, but also in certain cases of pulmonary tuberculosis.

Spaulding[59] discusses the general subject of heliotherapy and reviews the recent work on this subject in a concise and practical way.

Kime[32] urges that sunlight be used more than it is in the treatment of skin diseases and of various forms of tuberculosis. While presenting nothing new, the article is sane and sound.

Farmer,[16] reviewing the general subject of artificial pneumothorax, concludes that, when carefully and properly performed according to the best technic, it is a safe procedure; that it may greatly benefit certain cases not showing improvement by ordinary methods, but that it should be performed before the patient is in a hopeless stage.

Peters,[50] evidently an ardent believer in artificial pneumothorax, reports the results of his four years' use of this method. He believes that this is "the greatest weapon against tuberculosis that has yet been given the unfortunate consumptive."

Armstrong[3] writes more conservatively in regard to artificial pneumothorax than the majority, and his paper is welcome on that account.

Lapham,[36] well known as an enthusiastic believer in artificial penumothorax in the treatment of pulmonary tuberculosis, states her views on the subject and, going still further, urges more careful study into the possibilities of the surgical treatment of consumption.

Packard[46] cites, in great detail, a case of pulmonary gangrene of which artificial pneumothorax seems to have been the immediate cause.

Parfitt,[48] in a detailed and careful article considering the relation of pressure in inducing artificial pneumothorax, advises that not only the effect of pressure in the lung itself be considered, but also the effects on the mediastinum, heart, and blood vessels. He discusses the indications of mobility of the mediastinum.

Pathological and Bacteriological Studies.

Miller,[42] discussing the value of the complement-fixation test in tuberculosis, concludes that it is practically always positive in tuberculous and negative in non-tuberculous cases. It is negative to syphilitics who have no clinically active tuberculosis.

Corper,[14] as the result of an elaborate study of the complement-fixation test in tuberculous and in normal persons, finds it positive in only 30% of clinically definite cases of tuberculosis, active and inactive; but a definite positive reaction, in conjunction with other findings, makes the diagnosis certain. It is also of value in differential diagnosis, as against syphilis, cancer, abscess, etc. In non-tuberculous cases it is always negative.

Krause,[33] as a result of his investigations, has shown that tubercle bacilli can preserve their viability and their original resistance after being kept in a dried state for as long a time as from 15 to 17 months.

Krause[34] discusses the intricacies of the tuberculin reaction, and suggests that the symptoms of the general tuberculin reaction are due to the primary toxicity of focal products, the absorption of which is favored by the focal reaction that results from the injection of tuberculin.

Heise,[29] discussing the cutaneous tuberculin reaction, comes to the conclusion that the quantity of tuberculin necessary to produce a reaction of a given area bears no definite relation to the stage of the disease, and that, therefore, a single skin test, when positive, means nothing but the existence of a previous infection.

Economic, Social and Educational.

Baldwin,[4] discussing the consumptive and his neighbors, shows how much harm and unhappiness may be caused by the stigma of tuberculosis when unjustly applied. He protests against a state of affairs that stamps the tuberculous patient as an outcast and a leper, and is of the opinion that the present attitude of the public in this regard is in no way justified by the facts.

Maher[38] describes the various fields of work being undertaken by the physicians at the Connecticut state sanatoria. Such original investigations and researches should form an important part of the work of every sanatorium physician, and are of great value not only to the institution, but to the medical public.

Gwynn,[25] making an urgent plea for the conservation and protection of the health of school children, gives as necessary parts of any movement in this direction: (1) a full-time supervision, (2) more school inspection and nurses, (3) more fresh-air rooms and open-air schools for both well and tuberculous children.

Rucker,[55] discussing educational methods in regard to tuberculosis and the public, urges that modern advertising methods be used for this purpose just as they are so successfully used in business today. His article is full of practical suggestions.

Pierson[52] urges further institutional care of consumptives and discusses subsidy laws to assist in this process.

Sachs[56] says the prevalence of tuberculosis is, to a great extent, indicative of the general standard of life in that district.

Non-Pulmonary Tuberculosis.

Furniss[22] discusses renal tuberculosis, its diagnosis and treatment. It is a very chronic disease and apt to be latent for a long period. About one-third of patients first consult a physician for pain in the kidney region, and the rest for cystitis and vesical disturbances. Prognosis in cases operated upon is good as regards life, and fair as regards relief of symptoms.

Coleman,[18] discussing renal tuberculosis, urges more care in referring symptoms related to the bladder to the real source of trouble, the kidney. In 90% of cases presenting bladder symptoms, renal tuberculosis is the last disease to be considered.

Churchman[12] discusses the technic of diagnosis of renal and genito-urinary tuberculosis. He is optimistic in regard to tuberculous renal disease, and deplores the present somewhat pessimistic attitude toward this condition.

Holding[30] is an enthusiastic believer in the use of the x-ray in the non-operative treatment of tuberculous cervical adenitis, and reports numerous cases with good results. He thinks that non-surgical methods, such as x-ray, hyperemia, and tuberculin should be tried before any radical operation is done. He claims rather too much for x-ray in this regard.

Boggs[8] is of the opinion that when tuberculous glands in the neck have become unduly scattered and broken down, the x-ray is the best method of treatment, especially when there is pulmonary involvement. Surgery is necessary in some cases, but the number can be greatly reduced by means of the x-ray.

Metz[40] discusses with illustrative cases the various forms that tuberculosis may take in the eye. He describes the good results of treatment with tuberculin when other methods had failed, and the diagnosis by means of tuberculin tests.

Scott[57] describes in detail a case of tuberculosis of the tongue, and is of the opinion that it is more common than supposed. The differential diagnosis involves consideration of simple ulcers, syphilis, and malignant disease. The rational treatment is surgical except in far-advanced cases secondary to extensive pulmonary disease.

Miscellaneous.

Fishberg,[19] in a somewhat iconoclastic article, protests against ancient and time-worn fallacies in regard to the diagnosis and treatment of tuberculosis. He urges that a sharp line be drawn between infection and disease; that the old idea that healthy adults may be infected in institutions and elsewhere be discarded; also, that if tuberculosis is discovered early enough it can be cured; that the word "pre-tuberculous" be done away with. He urges that more attention be given to constitutional signs and symptoms in diagnosis, and that in children more conservatism be used before saying a child is consumptive, and calls attention to the fact that chronic pulmonary tuberculosis in childhood is rare. Much that he says in this article is sane and timely; there is also much, however, that is dangerous doctrine to spread abroad among the general public and the medical profession.

Michie[41] presents a careful study of the alarming conditions in regard to tuberculosis in an Eskimo village and one of the cleanest in Alaska. He found 61.5% of the children under 15 years of age to be actively tuberculous. He believes that here is one of the greatest fields for medical and missionary work.

Norris[45] brings up to date the important subject of pregnancy and tuberculosis from his experience in a large number of cases in private practice and at the Phipps Institute. He finds that about 20% of mild quiescent cases and 70% of more advanced cases have exacerbations during pregnancy or the puerperium. Tuberculous women should not marry unless the process has been quiescent for a moderately prolonged period, and should not become pregnant unless the disease is in the first stage and has been quiescent for at least two years. Every case must be dealt with individually. Interruption of pregnancy does not insure a favorable prognosis, but greatly improves it. Infants should not be nursed by tuberculous mothers, and at all times should be especially guarded against infection.

REFERENCES.

[1] Abrahams, R.: N. Y. Med. Jour., July 29, 1916.
[2] Arkin, A., and Corper, H. J.: Jour. Infect. Dis., April, 1916.
[3] Armstrong, A.: Penn. Med. Jour., January, 1916.
[4] Baldwin, E. R.: Survey, Feb. 22, 1916.
[5] Barber, G. H.: U. S. Naval Med. Bull., Vol. x, No. 1, 1916.
[6] Bay, H. H.: Ill. Med. Jour., April, 1916.
[7] Blaine, E.: Ill. Med. Jour., January, 1916.
[8] Boggs, R. H.: N. Y. Med. Jour., May 29, 1916.
[9] Bonime, E.: N. Y. Med. Jour., April 15, 1916.
[10] Brosamlen, O.: Münch. med. Woch., April, 1916.
[11] Browning, C. C.: Pacific Dental Gazette.
[12] Churchman, T. W.: Med. Rec., March 11, 1916.
[13] Coleman, C. A.: Ohio State Med. Jour., April, 1916.
[14] Corper, H. J.: Jour. Infect. Dis., September, 1916.
[15] Dutton, W. F.: Jour. of Oklahoma State Med. Assn., September, 1916.
[16] Farmer, W. C.: Texas State Jour. of Med., December, 1916.
[17] Farris, H. A.: Can. Med. Assn. Jour., December, 1916.
[18] Fish, J. B.: Med. Rec., Sept. 30, 1916.
[19] Fishberg, M.: Med. Rec., Jan. 22, 1916.
[20] Fishberg, M.: N. Y. Med. Jour., Dec. 2, 1916.
[21] Frazer, Thompson: South. Med. Jour., July, 1916.
[22] Furniss, H. D.: N. Y. State Jour. of Med., November, 1916.
[23] Gardiner, C. F.: Interstate Med. Jour., Vol. xxiii, No. 7.
[24] Gilbert, O. M.: Col. Med., October, 1916.
[25] Gwynn, W. C.: Jour. A. M. A., Nov. 11, 1916.
[26] Hamblet, M. L., and Barnes, H. L.: Arch. Inter. Med., September, 1916.
[27] Hawes, J. B., 2d: Boston Medical and Surgical Journal, July 27, 1916.
[28] Hawes, J. B., 2d: Boston Medical and Surgical Journal, June 1, 1916.
[29] Heise, F. H.: Am. Jour. Med. Sc., June, 1916.
[30] Holding, A. F.: Med. Rec., March 11, 1916.
[31] Kahn, M. H.: Jour. Lab. and Clin. Med., Vol. i, No. 8, 1916.
[32] Kime, J. W.: Med. Rec., February 12, 1916.
[33] Krause, A. K.: Jour. Med. Research, June, 1916.
[34] Krause, A. K.: Jour. Med. Research, June, 1916.
[35] Lapham, M. E.: Med. Rec., Aug. 19, 1916.
[36] Lapham, M. E.: Am. Jour. Med. Sc., March, 1916.
[37] Lord, F. T.: Boston Medical and Surgical Journal, July 27, 1916.
[38] Maher, S. J.: Med. Rec., Aug. 3, 1916.
[39] McCrae, T., and Funk, E. H.: Jour. A. M. A., September, 1916.
[40] Metz, R. B.: Cleveland Med. Jour., September, 1916.
[41] Michie, H. C.: Med. Rec., Oct. 14, 1916.
[42] Miller, H. R.: Jour. A. M. A., Nov. 18, 1916.
[43] Mills, N. S.: Med. Rec., May 6, 1916.
[44] Minor, C. L.: Med. Rec., Oct. 7, 1916.
[45] Norris, C. C.: Am. Jour. Obst. and Dis. Women and Children, Vol. lxxiii, No. 6, 1916.
[46] Packard, E. N.: Am. Jour. Med. Sc., June, 1916.
[47] Parfitt, C. D.: Trans. Twelfth Ann. Meeting Nat. Assn. for the Study and Prevention of Tuberculosis.
[48] Parfitt, C. D.: Trans. of the Am. Clim. and Clin. Assn., 1916.
[49] Perkins, J.: Inter. Clin., Vol. iv, Ser. 26.
[50] Peters, Le R. S.: Ill. Med. Jour., October, 1916.
[51] Pottenger, F. M.: Lancet-Clinic, Jan. 1, 1916.
[52] Pierson, P. H.: Trans. Cal. Assn. for the Study and Prevention of Tuberculosis, Jan. 27, 1916.
[53] Probst, C. O.: Ohio State Med. Jour., December, 1916.
[54] Rockhill, C. S.: Lancet Clinic, March, 1916.
[55] Rucker, W. C.: Jour. A. M. A., Nov. 11, 1916.
[56] Sachs, T. B.: Bull. Chicago Tb. Institute, June 1, 1916.
[57] Scott, James R.: Am. Jour. Med. Sc., September, 1916.
[58] Sheatle, A. G.: N. M. Med. Jour., October, 1916.
[59] Spaulding, H. J.: Jour. Med. Soc. of N. J., 1916.
[60] Townsend, D.: Can. Med. Assn. Jour., February, 1916.

Tuberculosis in Infancy and Childhood.

Methods of Infection.

Adriance,[1] in a practical and sane article of distinct value to the general practitioner, emphasizes the fact that tuberculous infection begins in early life in the home circle. A positive von Pirquet reaction in early life signifies a bad prognosis. He speaks of the importance of milk as a factor in such infections and urges that the pasteurization of milk be generally adopted.

Minor[16] strikingly emphasizes certain important factors in regard to infection with tuberculosis, such, for instance, as, "Tuberculous infection probably never, and certainly rarely, can occur outdoors," and that even indoors it usually takes a prolonged exposure under unsanitary conditions for *adult infection* to occur. He does not believe that the clean, intelligent consumptive is of danger to those in the house with him *if they are not* children or young people. He believes, therefore, that our attention should be focused on preventing infant and childhood infections, and that our chief problem lies in the question of protecting our children. Kissing children on the mouth should be prevented, milk should be pasteurized, coughing mothers and nurses should be examined: outdoor schools for well children should be encouraged, over-strenuous athletics discouraged. The doctor must not wait for symptoms to develop in the children under his care, but by careful supervision over their habits, school and home life, play and work, and by regular examinations should endeavor to prevent the occurrence of such symptoms. This article is full of sane and sound advice.

Pottenger[21] discusses in detail the part played by the lymphatic system as a protective agent against tuberculous infection and disease. He makes a plea against too early removal of tonsils and adenoids.

Ravenal,[22] discussing modes of infection, states that the intestinal tract in children is a frequent source and that, likewise, to him the tonsils appear to be the portals of entry in many cases.

Ustvedt[26] presents figures showing how much greater is the infant mortality in families where there is an open case of tuberculosis as compared with normal families. While his figures present nothing new, they emphasize the need of removing infants at once from a tuberculous environment. Such figures as here shown are of striking interest and should be utilized in educating parents as to the necessity of such removals.

Von Weller[27] reports two cases of miliary tuberculosis of the placenta, with clinical, though latent, tuberculosis of the mother. He concludes that the transmission of tuberculosis from mother to child prior to birth may not be so rare as usually thought to be the case.

Diagnosis.

Dana[1] is of the opinion that the average general practitioner is not sufficiently impressed with the importance and frequency of tuberculous infection in childhood and, especially, of the difference between infection and disease. He urges that children "below par" for any unexplained cause be given strict hygienic treatment and careful examinations by an expert. He also observes that in almost no case is x-ray evidence alone sufficient, and that it does not distinguish between latent cases and those needing active treatment.

Floyd, Boutwell and George[8] have made a careful and exhaustive study of bronchial gland tuberculosis in a large series of children, with detailed x-ray studies, and have come to sane and sound conclusions. Percussion is of value in the larger masses of glands; d'Éspine's sign need not be present in order to make a diagnosis, but only on a large number of comparatively minor signs and symptoms can a correct diagnosis be made. This article is of great importance and value.

Lapham[15] discusses the symptomatology of bronchial gland tuberculosis and, especially, the relation of such enlarged tuberculous bronchial glands to acute fulminating cases of tuberculous meningitis. She believes that in almost every case careful post-mortem examinations will show a definite relation between the glands and the subsequently occurring meningitis. Likewise, she is of the opinion that spinal disease may be closely related to bronchial gland tuberculosis. She describes the various aches and pains of vague and indefinite nature that may be attributed to these glands by pressure or otherwise.

Morse,[17] discussing d'Éspine's sign, states that the normal change of voice occurs between the seventh cervical and the first dorsal spine. The d'Éspine sign is positive, therefore, when the bronchial voice or whisper is heard below the seventh cervical spine. It is uncommon in children of the well-to-do and, when present, in them is probably not a manifestation of tuberculosis in more than 50%. It is to be doubted if even the opinion of such an authority as Dr. Morse would be concurred with by many of those who have studied this subject. Many believe, for instance, that an increased whispered voice or bronchial whispered voice may be heard as low as the third or fourth dorsal spine and be within normal limits, and that, *in the absence of other signs and symptoms*, the diagnosis of tuberculosis of the bronchial glands is not justified upon a positive d'Éspine sign alone.

Overend and Rivière[19] describe the location of the various glands around the root of the lung, and group them as follows, according to clinical manifestations: (1) normal, with no physical signs, (2) with right paravertebral dulness, (3) with double paravertebral dulness, (4) with parasternal dulness on one or both sides. They describe the features of each of these groups as seen by means of the x-ray. They conclude that thoracic glandular tuberculosis is very common in children of school age, especially in urban districts, but that there are, likewise, notable powers of resistance to control these infections, even extensive ones. They believe that both clinical and radiographic methods of diagnosis are of great and equal importance in diagnosis and should be used together in each case.

Reuben,[23] discussing the diagnosis of tuberculosis in infancy and childhood, is strongly of the opinion that fever is the first sign of such infection in infants, and that its course is a fairly typical one. In such cases, according to his experience, the tuberculin test usually becomes positive at the onset, or a few days after the onset, of the fever, although no physical signs are present at the time. He states that 30 to 35% of such infants survive these infections. The general trend of opinion would hardly support these statements either as to diagnosis or prognosis, although his ideas as to treatment are sound.

Smith and Bibby[24] always tried to answer the following two questions in every case brought to their clinic. Has the child been infected with tuberculosis? This is answered by the tuberculin skin test. Is the infection latent or active? This was answered by a careful study of the history, signs and symptoms which they describe in detail. Impaired nutrition, anemia, undersize, and failure to gain weight are important points. Fever, over a considerable length of time, is suggestive. Loss of appetite, fatigue, are valuable symptoms. Cough and positive chest signs are rare.

Weith,[28] discussing the greater incidence of tuberculosis in Lausanne, as compared with other Swiss cities, raises some interesting questions as to what is to be gained by applying the von Pirquet test to all the children in the city. In view of the fact that upwards of 90% of all children of school age are already infected and would thus respond to such a test, what in particular is to be gained by applying it? He believes, and rightly so, that of far greater importance than this is the elimination of the sources of infection instead.

Treatment.

Dowd[5] reports on the results of 687 cases of tuberculous cervical adenitis treated by a radical operation. His results are good, and he is an enthusiastic advocate of this method.

Gauvain[9] emphasizes the fact that heliotherapy alone cannot accomplish wonders, but that it should be used in conjunction with other methods of treatment. Beneficial effects cannot be obtained unless the skin is pigmented. He gives rules for treatment along the usual lines.

Golden[10] urges more conservative treatment with tuberculin, hygiene, etc.; Morris[10] likewise reports good results without radical surgery, using x-ray, tuberculin, and hyperemia.

Holding[11] is enthusiastic over x-ray and believes that conservative methods should be tried before radical excision.

Howell[12] believes that the primary lesion is represented by a mass of glands, usually around the roots of the lung. The three essentials of treatment are: rest until long after symptoms have disappeared, fresh air, and sunlight. He makes no mention of tuberculin in treatment.

The Weekly Bulletin of the New York Board of Health for June, 1916,[29] describes a group of children under observation at an Italian tuberculosis clinic in New York City, who had been undergoing systematic and regular corrective gymnastic exercises during the year. Such classes and such exercises form an important part of preventive work among children.

Albert-Weil[2] believes in x-ray and conservation surgery.

Pathological and Bacteriological Studies.

Dunn[6] discusses the source and mode of infection by tuberculosis in early life, with special reference to the work of von Pirquet, Ghon, and others. The diagnosis he bases in physical signs in the chest, such signs being absent in nearly 50% of his cases; tuberculin tests, these were negative in 50% of his cases, and x-ray examinations, which were positive in every case.

Eastwood and Griffith,[7] in 261 cases of bone or joint tuberculosis, found the human bacillus in 196 cases, bovine in 55, and atypical forms in 10; in 155 cases under 10 years of age 29% was bovine; in 106 cases over 10 years only 9% was bovine.

Marfan,[18] discussing the occurrence of tubercle bacilli in milk, urges that all cows' milk be boiled or pasteurized, as the most practical method of preventing this source of infection.

Social and Economic Problems.

Jeanneret[13] believes that it is largely by means of the school and the care and instruction of school children in health matters that tuberculosis is to be stamped out. Between the years three and five the lymphatic system prevents any tubercle bacilli from entering the body. Such a child is not diseased, but merely infected or sensitized. It is our task to distinguish between those who are merely so infected and those who are actually diseased because the barriers of defense have broken down. He urges that each child have his health chart and that the von Pirquet test be applied once a year. He describes a system of gymnastic exercises performed in the open air, with the children's bodies stripped to the waist. Such exercises should be largely thoracic. Fully an hour every day should be devoted to this purpose.

Kingsley[14] presents a program for the promotion of welfare of children and the prevention of tuberculosis among them. This work is along the following lines: (1) The creation of institutions and agencies for the care and relief of those who have tuberculosis and for safeguarding their families. (2) The conduct of a vigorous educational campaign, with especial reference to training and educating the child in matters pertaining to hygiene and physical welfare.

Stern[25] urges that measures be taken to decrease the mortality of tuberculosis among children of school age by improving the personal and home hygiene. Teachers and social workers should play an important part in this work.

Prognosis.

While opinion differs as to the prognosis of tuberculosis in infancy, Combe[3] is of the opinion that, while it is very grave, it is not absolutely fatal. The younger the child, the less the powers of resistance. The virulence of the infection is an important factor, while the clinical form of the disease is a still more important factor. If the disease, when discovered, is still localized to glands, the outlook is less serious.

Permin[20] believes that only during the first year of life does a positive skin test indicate a grave outcome.

REFERENCES.

[1] Adriance, Vanderpoel. Boston Medical and Surgical Journal, Aug. 17, 1916.
[2] Albert-Weil, E.: Paris Méd., 1916, 6, 261.
[3] Combe: Le Nourrisson, 1916, 4, 302.
[4] Dana, H. W.: Boston Medical and Surgical Journal, May 25, 1917.
[5] Dowd, C. N.: Jour. A. M. A., 1916, 67, 499.
[6] Dunn, C. H.: Am. Jour. Dis. of Children, February, 1916.
[7] Eastwood, A., and Griffith, F.: Jour. Hygiene, 1916, 15, 257.
[8] Floyd, C., Boutwell, H. K., and George, A. W.: International Clinic, Vol. iii, Series 26.
[9] Gauvain, H. J.: Brit. Jour. Tub., 1916, 10, 111.
[10] Golden, J. F., Morris, R. I., and Ladd, W. E.: Jour. A. M. A., 1916, 67, 503.
[11] Holding, A. F.: Med. Rec., 1916, 89, 471.
[12] Howell, W. H.: Boston Medical and Surgical Journal, Sept. 21, 1916.
[13] Jeanneret, L.: Rev. Méd. de la Suisse Rom., August, 1916.
[14] Kingsley, S. C.: Jour. A. M. A., 1916, 66, 73.
[15] Lapham, Mary E.: N. Y. Med. Jour., Oct. 21, 1916.
[16] Minor, Charles L.: South. Med. Jour., February, 1917.
[17] Morse, J. L.: Am. Jour. Dis. of Children, April, 1916.
[18] Marfan, A. B.: Le Nourrisson, 1916, 4, 34.
[19] Overend, W., and Rivière, C.: Arch. of Radiol. and Electrotherapy, August, 1916.
[20] Permin, G. E.: Hospitalstidende, 1916, 59, 697.
[21] Pottenger, F. M.: Jour. A. M. A., Nov. 11, 1916
[22] Ravenal, M. P.: Jour. A. M. A., 1916, 66, 613.
[23] Reuben, M. S.: Arch. of Ped., March, 1916.
[24] Smith, C. J., and Bibby, H. L.: Arch. of Ped., 1916, 33, 782.
[25] Stern, E.: Ztschr. f. Tuberk., 1915, 24, 436.
[26] Ustvedt, Y.: Norsk Magaz. f. Laegevidensk., October, 1916
[27] Von Weller, C.: Arch. Int. Med., 1916, 17, 509.
[28] Weith: Rev. Méd. de la Suisse Rom., Sept. 20, 1916.
[29] Weekly Bulletin of the N. Y. City Dept. of Health, June 17, 1916.

Original Articles.

THE RATIONALE OF NEURASTHENIA AND OF DISTURBANCES OF ARTERIAL TENSION.*

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This paper is written to emphasize, to revise and to enlarge upon certain ideas in a former paper entitled "Affective Activity, Emotion, as the Cause of Various Neurasthenic Bodily Diseases." † It will present the fundamental nature of real physical diseases. The medical profession has scarcely begun to appreciate the reality and the tremendous importance of neurasthenic, affective diseases. While their symptomatology is somewhat recognized, their etiology, their nature and, largely, their treatment have suffered the fate which frequently befalls un-understood phenomena of nature—erroneous theories have been offered in explanation and have been devoured with superstitious eagerness. It is safe to say that three-fourths of the people are affected more or less by affective diseases and could be benefited by correct professional attention; that one-half of the people need treatment and that one-fourth of the people are nearing premature death for lack of correct treatment. People having affective diseases need, first for diagnosis and then for treatment, the attention of the physician with broad knowledge of the causes, the pathology, the symptomatology and the treatment of many various diseases.[‡] The existence of narrow-minded, fanatical, unscientific, fake therapeutic cults, and their patronage by supposedly intelligent people, is one of the surprising things in an advancing civilization. To the medical profession and to the public, a knowledge of normal and abnormal psychology and the relations existing between mind and body in health and disease is in these days of even greater importance than a knowledge of the exanthemata.

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As the scope of the theme of this paper is so large, it must be evident that it will be impossible to go into a complete discussion. You may imagine that I insert at various points, the term "and so forth and so forth," or, as I prefer to say, "*et cetera* and so forth."

Our sensations, ideas and actions arouse in our minds various degrees of two extreme forms of affectivity which have been called pleasure and pain, or pleasantness and unpleasantness. This two-fold nature of affectivity is one of the most important things in all life. Each individual affective reaction may be of short or of long duration. I wish to emphasize the fact that affectivity is not altogether merely an instantaneous effervescence which follows after individual sensations, ideas and actions, but is also a more or less persisting activity. There is at every moment of our lives a constant centrifugal current of affectivity which forms the chief ingredient of the ego. It can no longer be held that affectivity is merely a momentary reaction. The momentary affective reaction is only an episode, a ripple, in the larger incessant stream of affectivity which is, according to nature, the resultant of all our past construction, function and experience. Special attention should be given to the fact that an episodic affective activity may be so strong and persisting as greatly to modify or even quite to replace the previous constant current. Such changes in the constant current produce alterations, more or less radical, in the ego, which may remain within the range of normality or become abnormal. If the ego becomes abnormal it may become merely medically sick, or in addition sociologically sick. Whatever may be the state of the ego the constant current of affectivity is an active, powerful force which radiates from the brain into the glands and muscular tissues of the body, producing peripheral effects which are of fundamental importance to the life of the individual and of society.

When I began practice, about eighteen years ago, but little was known about the autonomic or sympathetic nervous system. I worked out essentially all my ideas about affective diseases, except those on the heart beat, soon after I began work, in 1903, in a clinic having a large number of neurasthenic patients. My discoveries were worked out entirely on a clinical basis with a knowledge of normal psychology, of psychiatry and of general medicine, the two former being far in the background of my mind. The very same month in which my former article was published, a most excellent article entitled "The Interrelations of Emotions as Suggested by Recent Physiological Researches," by Prof. W. B. Cannon, was published in the *American Journal of Psychology*. If one centers his study upon the autonomic nervous system as such he is apt to lose sight of the fact that the nerves and the associated ganglia are to a great extent only a conducting apparatus for emotional impulses originating in the brain. Several articles which have been published in journals and books during the last few years, thus miss this chief point. Cannon's experiments preserve, so far as is possible with animals, the connection between the mental and the organic phases, but, while they show up the fundamental identity of some of the basal emotions of man and beast, such as rage, they reveal but little concerning the finer emotions of man. The initial and the final observations must be made in a clinical way on living man, but the simpler and more limited results of animal study should not be lost sight of. Although much analytical systematization can be accomplished among the various activities of the autonomic nervous system, the whole matter is quite complicated and presents many instances of activities in a circle, and that circle is indeed often vicious.

Emotions may be placed in two fundamental divisions: violent and pathetic. The former is the spirit of opposition; the latter is the spirit of love. The affective activity of violent emotions, or violent affectivity, radiates to the periphery over the thoracico-lumbar, or more commonly called sympathetic, division of the autonomic nervous system. The affective activity of pathetic emotions, or pathetic affectivity, radiates to the periphery over the cranial and sacral divisions. I have chosen the names "violent" and "pathetic," because in the light of animal experimentation and of clinical observation, they seem to be the best generic designations. One might wish for a more appropriate word than "violent," but I do not think of any and, after all, with due regard to its necessarily generic application, it is quite appropriate. It should be noticed that the terms "pathetic," and "sympathetic," apply to a form of affectivity and to a division of the autonomic system, respectively, and that they have nothing to do with each other directly. The term "sympathetic," applied as it has been, is a sad misnomer. These two classes of affectivity are to be observed existing in individuals in a more or less isolated form and in other individuals in all sorts of combinations. Hence, the similarity and the diversity of temperaments. The affective activity of violent emotions produces, among other peripheral reactions, contraction of the arteries and increased force of the heart beat or increased tonicity of the heart muscle. The affective activity of pathetic emotions produces, among other peripheral reactions, relaxation of the arteries and diminished tonicity of the heart muscle. These two sets of phenomena exist, in certain amount, normally, that is, in physiological and psychological normality and from them, just as plainly as 2 and 2 are 4, there develop two pathological forms of affectivity, two forms of neurasthenia, the sthenic (violent) and the asthenic (pathetic).

[‡] See my communication on Mental Treatment by Physicians in The Journal of the American Medical Association of July 3, 1909.

Sthenic neurasthenia may be a term to which you object on etymological grounds, but even on these grounds the objection is not valid for, as you will see, both forms of the disease are asthenic, neur-asthenic, but as compared the one to the other, one is sthenic and the other is asthenic. The qualifying adjective merely distinguishes one form from the other. When a person more or less continuously meets with things which arouse his opposition, whether that opposition is limited to mental work or includes also physical work, the affective radiations of violent emotion take place so intensely that the nervous system becomes more or less exhausted (asthenic), the affective activity becomes more or less firmly established and consequently the arteries become more or less permanently contracted, and the tonicity of the heart increased. That is, a reaction which more properly should take place only in occasional emergencies, may become continuous, and the nervous system become weakened and irritable. The excessive stimulating affective current causes the victim to become excessively active, impatient and restless. The symptoms vary considerably according to the strength of the affective current and the general mentality of the individual. In one, there may be observable only an increased activity in face of business difficulties. At the other extreme, murder may be the startling revelation of violent pent-up affectivity.

The physical manifestations of violent affectivity are to be found also in certain forms of insanity, particularly in dementia praecox, the depressive form of manic-depressive insanity and involutional melancholia. So far as I am aware, existing reports on the condition of the arteries in the insane state that there is no essential departure from the normal. Several years ago, through the courtesy of the superintendent and staff of the Utica State Hospital for the Insane, I made a short study of this subject in that institution. In brief, I found that, although some of the patients having the above-mentioned diseases had blood pressure that was normal, some of them, especially in the two first-mentioned classes, had pressures which were apt to be somewhat above normal, but all the patients in all the classes mentioned had arteries which were contracted. The dementia praecox patients were especially noticeable because their systolic pressures might be considered normal but their pulse pressures were small and their arteries were very much contracted. A case that had had catatonic stupor for three years had a systolic pressure of 95 and a diastolic pressure of 74, and his arteries were contracted very tightly. These findings illustrate a point I have long realized,—the great importance in general practice of looking for arterial tension as well as for blood pressure, and the great importance of using an educated finger together with, or, as a routine to a great extent in preference to, the sphygmomanometer. The tactile estimation of arterial tension apart from blood pressure or, preferably, in connection with blood pressure, is very much neglected. These findings also emphasize a fact which I made in a paper read before this society seven years ago: that neurasthenia and insanity, although characteristically different in some ways and similar in some ways, are both of affective origin and nature. In neurasthenia and in insanity there are the same bodily reactions to disturbing affectivity, but in insanity there is great lack of correct mental adaptation to environment, the mental processes being so fully flooded by the abnormal affectivity. The tightness of the arteries in these insanities is not at all surprising. In fact, it should be expected, for the greater the affective activity of the kind we are now studying is, the greater the arterial contraction always is. Likewise, the greater this affective activity is, the more apt there is to be an increase in the tonicity of the heart muscle (stenocardia) instead of increase in force of the systoles of the heart.

The relations existing between affective activities and the glands producing internal secretions form a very important sub-topic but cannot be taken up in this limited paper.

An example of a complex which does not seem to fit into the rigid classifications formed by animal experimentation on the emotions is seen in patients having arteries relaxed but full, and heart relaxed but acting with increased systolic force which distends the arteries and eventually gives rise to cardiac hypertrophy and high blood pressure. This is a common combination of affective activities. The relaxed heart and arteries usually indicate a more or less pleasurable state of mind and the increased force of the heart indicates a vigorous effort-full state of mind. And yet I have seen this same combination when the relaxation of heart and arteries indicated great loving concern and the great heart force indicated a determination to do all possible. Both of these mental conditions would often give rise to the physical activities noted. The increased force of the heart would indicate the effect of a violent affectivity passing over the thoracico-lumbar nerves, and the other activities, the relaxations, would indicate a pathetic affectivity passing over the vagus. It might be said, in passing, that the varied and apparently contradictory results which physiologists have obtained in stimulating the vagus may be due to the presence of a variety of fibers in the nerve used in transmitting various forms of emotional currents.

Long-continued contraction of the arteries or their distention by the blood stream naturally causes, on account of the resulting compression of the tissues, a diminution of the blood supply of their middle or muscular coat. Although the term "tension" of arteries is used loosely to apply to either or both active contraction or passive distention, tension should be used to apply to the former and distention should be used to apply to the latter. Both tension and distention, and, of course, both together, render the media more or less ischaemic, and this ischaemia leads in time to degeneration of the media and its replacement by fibrous tissue—and here is the secret of arteriosclerosis! By arteriosclerosis, I mean a disease affecting the arteries quite generally, although it may be somewhat more marked in some places than in others. Infections of the arterial walls may cause inflammations which may terminate in replacement fibrosis, but the process is localized and primarily pathologically different from that of arteriosclerosis and should be classified as an inflammation. (General arteriosclerosis is in rare instances caused also by other conditions, for example lead poisoning, in which there occurs contraction of the arteries. I shall not waste time or energy to refute the absolutely unfounded theories pertaining to intestinal autointoxication as a cause of arteriosclerosis, but refer to my former article and to the excellent article on autointoxications in the recent edition of Osler and McCrae's "Modern Medicine."

Books on practice express surprise because in case of apoplexy, pulmonary hemorrhage, etc., impaired arteries often rupture while the patient is at rest. This occurs simply because the blood pressure is raised by arterial contraction induced by currents of predominating violent affectivity. In certain neurasthenic patients the violent form of affectivity tightens up the arteries while the patient is reclining, and this may occur very soon after going to bed, at any time during the night, or soon after awaking. Insomnia or restlessness or headache or nausea or polyuria or angina or night fright or dyspnoea, or an attack of disordered heart-beat may be brought on by this unwelcome affective activity and its tightened arteries. Violent affectivity is one of the most terrible despots with which man has to contend. (Predominating pathetic affecitvity causes the arteries to relax during rest). It should be observed that the blood pressure readings during rest following exercise should not, as they very, very often are, be used as an index of the efficiency of the heart muscle unless they are carefully analyzed. Blood pressure readings and arterial tension during rest are an index of affectivity even more than of cardiac efficiency, and the same thing is largely true also during exercise. Indeed, the functioning of the heart, from moment to moment, depends much on the present affective currents, and therefore the very muscular condition of the heart at any moment depends much on what have been the past affective currents.

When one meets with things which arouse intensely his pathetic affectivity, as through pained love and grief, the disturbing affectivity, if strong enough, becomes firmly established and exhausts the nervous system and causes, among other things, the arteries to become relaxed, the heart to become relaxed and its systole weakened. Asthenic neurasthenia ("vagatonia") develops, and if it goes on far enough, complete nervous prostration results. In asthenic neurasthenia and nervous prostration the nervous system is weakened both by the disturbing intense affectivity and by the diminished blood supply sent to it by the relaxed blood-vessels and heart.

In marked asthenic neurasthenia, especially in nervous prostration, the physical facts that stand out most prominently are the relaxation of the arteries and the low blood pressure. During recovery this arterial relaxation changes to marked contraction. The blood pressure, on account of the reduced condition of the heart muscle, does not become raised above what is generally considered normal figures for the systolic reading, but the diastolic reading is high in comparison, on account of the contraction of the arteries. (Digital examination of arteries in these cases is important.) The heart takes on renewed activity. These physical changes are due to the gradual subsidence of the excessive pathetic affectivity and the bounding-up of the previously suppressed violent affectivity in the brain cells, and the consequent increased function of the medullary vaso-constrictor center and of the paravertebral ganglia of the thoracico-lumbar division. (A similar reaction occurs during recovery from many severe general diseases during the course of which the various structures of the nervous system have become much impaired.) The increased force of the blood stream causes a very excessive stimulation of all these weakened nerve cells and there results therefrom very great restlessness of mind and body.[*] The extreme contraction of the media of the arteries renders it ischaemic and arteriosclerosis will result unless relief is furnished.

In whatever way the arteries are acted upon by affective currents in the conditions already described, the capillaries tend to be acted upon in the same way. This is an important fact, for it has an intimate bearing on the metabolism and the nutrition of every tissue in the body.

There are certain apparent oddities in the nature of the affectivity and the peripheral reactions which are in various individuals aroused by various mental and physical experiences. An experience which arouses pathetic affectivity in some people may in other people arouse violent affectivity; a slap on the back may be a mere titillation to some, but may stir up great irascibility in others, depending on the individual's interpretation of the act and the dominant affectivity at the time which, so to speak, assimilates the act to itself. A business reverse or a family jangle or other cause for great worry, while being unwelcome to all, may tend to prostrate some and to excite violence in others, according to the prevailing strong affectivity filling the mind at the time of the occurrence and to a greater or less extent on the mental maneuvers of the individual to avoid mental perturbation. Encountering a lion in the wilderness may arouse great fear in two men, but in one the arteries may tighten and in the other they may relax and still either one of them may either run or fight. A certain physical task may tighten the arteries of one man and relax them in another, for to one the work is displeasing or difficult, and to the other it is pleasing and not difficult: the ready accomplishment of a physical or mental task tends to relax the arteries while the great difficulty of a task tends to tighten the arteries. The knowledge that one has a physical disease may make one person wild, while it may prostrate another and not disturb a third. The sexual orgasm may in one person cause relaxation and in another tightening of the arteries. These facts show, among other things, the great importance of the prevailing, fundamental, firmly fixed affectivity which largely determines the manner in which experiences of life shall affect the mind and body.

(The term "surgical shock" is applied undoubtedly to two conditions which are apparently the same but which are really entirely different subjectively. Which one of these two conditions shall appear in any case is determined by the prevailing emotional mechanism in the patient. When the pathetic emotional mechanism predominates, the patient's arteries become relaxed and his heart dilated. When the violent emotional mechanism predominates the patient's arteries become tightly contracted and his heart excessively contracted. Therapeutically, I wish to suggest that convallamarin and adonidin are good remedies to stimulate contraction of the heart and arteries and, of course, nitroglycerine is good to cause relaxation. These remedies are all very quick in action and may be given dissolved in a few drops of water and poured down the throat or may be given hypodermatically with centripetal massage.)

The varied experiences of life, although tending to arouse predominantly in the individual either pathetic or violent affectivity, often arouse in the same individual both forms of affectivity to a considerable degree. The peripheral effects of these two opposing currents, while supplementing each other largely, tend to balance each other more or less and the nervous system may become very much weakened. The resultant condition requires careful analysis by the physician.

A desirable fundamental affectivity, sufficiently well fixed and yet allowing sufficient normal flexibility, is a precious thing and much can be done through various educational channels toward putting it into the minds of many people to the promotion of the happiness of individuals and nations. An affectivity can to some extent be built up, but undesirable affectivities are often most difficult to reconstruct and are among the very greatest calamities of mankind. A knowledge of affective diseases would help those who would use such knowledge to avoid experiences which would arouse damaging affectivity. In a state of sufficiently good health the human will can, indirectly, by regulating sensations, ideas and acts, control, sometimes more and sometimes less, the affective experiences; but when intense affectivity has done its damage, the victim can always recover more quickly and more completely with medical aid and often cannot recover at all without medical aid. I know absolutely that if medical science is given the opportunity, and is given the opportunity soon enough, in each case, it can do undreamed-of things in correcting abnormal affectivity and the dire results to which it leads. The scientific application of stimulation and sedation by various therapeutic measures,—medicines, baths, massage, exercise, rest, psychotherapy,—whatever may be indicated, and the suppression of narrow, unscientific cults, can accomplish the cure of most cases of affectively sick humanity. This is no idle dream. It is a scientific fact. The proper use of sedative and antispasmodic remedies to control the excessive activity of the arteries and heart and the disturbing affectivity can do much toward this end. In treating these ailments it must be realized that affective conditions are complex and that a careful diagnosis must precede an exceedingly careful and painstaking treatment.

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[*] There is no power in the human mind which can, unaided by medicine, control this contraction of the arteries and this great general nervousness, notwithstanding the opinion of a certain man who vociferously asked a patient of mine why she did not use her will and get well! Such a patient can use the will merely like the patient with a broken leg—to place himself in the best circumstances to get well, to let nature, with the assistance of treatment, repair the damage done; that is, he can limit his mental and physical activity to prevent an aggravation of his discomfort, but he cannot hasten his recovery one bit by any mental effort.

The condition of the kidneys should be ascertained, whether they are normal or the seat of nephritis, or whether they have been damaged by the disturbances in the circulation, being slightly injured or irreparably injured by a resultingly sclerotic process.

INTESTINAL STASIS.*

By Mark H. Wentworth, M.D., Concord, Mass.

There is no doubt that intestinal stasis is a live question. It is the cause of much depression, lack of vitality, and disease. Nothing that is as serious as this can be considered premature to discuss, yet it is early to make too positive or dogmatic statements as to the results which can be obtained by abdominal manipulation. First, recognizing our physical condition, the problem comes up: How will it best be relieved? Cathartics have been used for centuries; we do not like their use, certainly not their continued use until it has become a habit. Massage has been used to give tone to the abdominal muscles and thus aid in the process of elimination, and as such it has its place; but massage, pure and simple, is not effective enough to be entirely satisfactory. Another objection to cathartics is that in many cases of stasis there is an atonic cecum, with an incompetent ileo-cecal valve and dilated distal ileum. The laxative only drives the feces from the ileum into the cecum, which soon becomes ballooned, and this only aggravates the atonic condition. A purge is followed by constipation, because the canal has been so freed of feces that there is little left for the peristaltic waves to act upon. This complete emptying of the canal is avoided by the procedure of Dr. Edwin L. Drowne of Boston, which can remove adherent masses at the flexures left untouched by other methods. This is quite different from what is ordinarily known as massage; this is confirmed by a nurse, well versed in Swedish massage, who showed the method to physicians in Sweden, and they acknowledged that it was something quite different from their procedures.

Rolling a cannon ball over the region of the colon was, as far as I can learn, first suggested by Sahli. This principle is right, also, only in a limited degree; as, if there is already an impaction at the flexures, it will roll up the masses at these points and make the impaction worse than before. Enemata are, also, helpful, but they, too, cannot reach far enough and are not to be depended upon solely. The ideal answer to prevent the condition from arising is, of course, manual labor in the open air and more normal living; but, unfortunately, our patients won't or can't follow this advice.

The method of deep abdominal manipulation, as developed by Dr. Drowne, has given results which will scarcely be believed. This avoids the errors of the above-mentioned methods, and is so effective as to reach nearly all cases of stasis. My eyes were first opened to the advantages of the method in 1913, when, upon routine physical examination of children in the Boston Dispensary, I noticed that a number of the pasty, underdeveloped, spiritless children had resistant masses in different parts of the large intestine, and I tried the method of breaking up these masses digitally and moving them along until the children were having one or two regular movements a day and their symptoms cleared. These efforts gave me only slightly encouraging returns for some months, or until I had improved my technic, when results became more definite. Formerly, I had rung the usual changes on the cathartics, but with only the usual success, that is temporary, but little permanent improvement. Some of those under manipulative treatment did not begin to show signs of improvement for weeks, but when the mass had once been well moved it was usually comparatively easy to keep the colon free.

Just what method Maggiora,[1] of the University of Turin, used, I do not know, but he reports experiments upon himself in which he states that pétrissage, or kneading, had more influence than any of the other forms of massage.

We know that massage stimulates capillary activity, the general circulation, and the vasomotor system. The muscle walls of the vessels and of the intestines are composed of involuntary fibres, which respond to mechanical as well as to other forms of stimulation when taken from the body; upon mechanically stimulating a piece of resected intestine, characteristic, slow, peristaltic waves are clearly seen; how much more vigorous must these wave movements be in the living tissue! We all recognize that a powerful abdominal muscle wall is an aid in the act of defecation, and as kneading of the deeper tissues necessitates a massage of the muscular walls, our work is doing a double duty.

Douglas Graham[2] quotes Sahli as reporting that he has "cured nearly all his cases of torpid bowels" by the use of the cannon ball and no medicine.

Just how much psychic effect is produced by this treatment it is impossible for me to say, but I know from actual experience the effect regular, deep, systematic manipulations have had on cases of true epilepsy, headache, tonsillitis and mouth-breathing—to mention only a few of the disturbances which have, I will only say, been much better after treatment than before.

An example or two:

Mrs. M., 38, mother of three normal children, gave a negative family history; no psychic disturbances whatever in any branch of her family. Has had convulsions since early childhood, almost never less than several in a month; at one time, daily for over three months. Was very discouraged; husband states: "On the verge of tears most of the time for the past month and more; worse during the past two weeks." Dec. 30, 1915, 1.30 a.m., crying, irrational, is going to die, has made will, etc., etc. Physical examination negative, save colon, which was much distended and resistant. At the splenic flexure was a mass the size of an orange, not much larger than the rest of the canal, but much more resistant. After a week of daily work over the colon and daily enemata she showed much improvement, but was yet far from well. At the end of another week she was so much improved that she wanted the treatment stopped, but we persisted in two or three manipulations a week until Jan. 15, when she seemed so bright and well that her husband said he hadn't seen her so well for years. My arguments for continued treatment were of no avail, and she remained perfectly well till the end of January, when she had another very slight attack—seven weeks of completely normal life. Again all went well until early in June—over four months of rest for herself and family. On June 10, I learned that there had been nocturnal seizures for several nights previous. Physical examination showed the colon again well blocked at the splenic flexure, but nothing like what I had found six months before. She then had daily manipulation until near the end of June, with a complete subsidence of symptoms which, however, had recurred during the first few days of the treatment, not clearing completely till June 15—then six weeks of freedom from the malady. This sort of thing kept up off and on for many months. Near the end of June I called them up and found that the patient had had but one or two transitory seizures since the middle of December, 1916,—another six months' period of comparative ease. That cathartics and enemata would have done the same thing, we know is not the case here, as she had been treated by these very agencies before with less help than she received from the manipulative procedures, both as to the amount of relief given and duration of freedom from symptoms.

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* Read at a meeting of the Chirurgical Society at Boston on June 29, 1917

Another case of epilepsy:

H. L., 20, single. Family history negative as far as either parent knows. Convulsions began at the age of eight; was under the care of Dr. X. for a year and a half—1909-10—when he was thoroughly saturated with bromides, without more than a dulling of the symptoms, which persisted. The bromides were then completely stopped, and the father reports that the boy nearly died, the convulsions were so violent, and he was so banged and bruised that he stayed in bed for two and three weeks at a time. Again he was put on bromides by his local physician in January, 1916—72 grains a day. He gradually improved somewhat, but in May the attacks began again, getting gradually more and more severe until they were almost every day, and often two or three in a single 24 hours. He came to me the first of November, 1916, and I began at once to give him deep colon manipulations every other day. Although I could determine no actual blocking in the colon, it did not seem as soft and free as it normally should. At the end of a week the seizures ceased, with the exception of four transitory periods of unconsciousness, none of them at all severe, for a whole month. He had not had such a period of freedom and rest for years. In December he had five or six attacks; three of them he said were momentary only, not complete unconsciousness even,—a new phase in the condition, to him. He had but four attacks up to March 2, the last day that I saw him just nine weeks. The parents admitted much improvement, and the boy said that he felt a distinct change for the better during my work over him. His color and general appearance were certainly changed for the better, and his mental attitude was much brighter than when he first came to me, but as he wasn't "cured" the parents gave up further effort.

During the past year and a half numerous children with chronic sore throats have been given this treatment with apparently more or less permanent relief; cases which had formerly been treated with gargles, sprays, and various drugs. A few children who had been subject to recurring colds and had become mouth-breathers, were treated on the same principle—efforts to increase the elimination and give a better circulation—and it has been met with gratifying results. Nearly all the mothers are enthusiastic, and declare it has been the one form of treatment which has been effective in bringing back the normal health and strength of their children and keeping them in good condition.

It is not at all uncommon to find a bad complexion become worse during the first two or three manipulations, only to clear completely under an extended course, and this, I feel, is in line with the whole theory: more toxins are freed in the intestinal canal by the breaking up of the fecal masses, and as these are not eliminated at once, they naturally are absorbed into the general circulation, the protective mechanism having broken down, causing an increase of the eruptive features. For the same cause, patients subject to headache from intestinal toxemia occasionally complain of more head symptoms during the first few manipulations, only to find themselves entirely freed when the elimination becomes effective.

That these observations have been made again and again in cases of chronic constipation, I am well aware, but cathartics do not affect some of these cases at all, and that is because they fail to remove the impacted fecal masses. I have frequently found masses as large as an orange at the hepatic or splenic flexures which were not affected at all in size or density by a number of different laxatives, but which were broken up and passed along by manipulation, with a consequent marked and usually complete relief of symptoms.

Patients who have had recurring headaches over periods of years, seldom going over a few weeks without one, who have got temporary relief only from the coal-tar products, have come to me: and having made a diagnosis of stasis, I have been able to move on the obstruction, free the bowel, and so to stimulate peristalsis that there has not now, after several months, been any return of the symptoms.

Lane,[3] in his "Operative Treatment of Intestinal Stasis," believes that the large intestine, being the cesspool of the tract, retains its contents a comparatively long time and therefore tends to become displaced, the primary factor being the delay in the passage of the contents. That this condition is not always a purely surgical one, is familiar to all who have read Lane's work, where he states that: "Surgeons not finding a definite ileal kink or controlling appendix, on the presence of which they are likely to place too much stress, jump to the conclusion that there is no obstacle to the passage of material from the ileum to the cecum. Nothing can be more fallacious. The block from accumulation in the cecum is the most important factor, the ileal kink and controlling appendix being superadded features in a large proportion of the cases."

He shows by bismuth x-rays that delay in the ileum in simple stasis may be of very long duration. It is evident, then, that there must be marked changes in the delayed contents in the small intestine, from which we understand most all of the intoxication takes place. He goes so far as to say: "Rheumatoid arthritis . . . is never present except in association with auto-intoxication due to chronic intestinal stasis. . . The thyroid is liable to various infections which cause the several forms of disease of that organ, such as ophthalmic goitre, general hypertrophy, the development of adenomatous tumors, of cysts, and finally of cancer. None of these conditions can arise except in the presence of intestinal auto-intoxication."

Cathartics, large quantities of water, the washing out of the stomach, when material is dammed back and decomposes, and enemata, he calls the essence of the so-called cures, which frequently effect a temporary alleviation of symptoms, but that they are tedious, dangerous, and at best only palliative. "From the surgeon's point of view the treatment of chronic intestinal stasis consists in facilitating the passage of material through the several portions of the intestinal tract and so obviating the mechanical and chemical results, and any fault or faults which may develop along its length consequent on the peculiar mechanical relationship of the individual to his surroundings. . . In the vast majority of cases the use of liquid paraffin . . . the application of some support to the abdomen. . . supplemented by massage," or as I like to term it, "manipulation," it being such a completely different process, "are sufficient for the purpose." After discussing his surgical technic at length, Lane says: "The main principle that guides me in my treatment of these cases is to remove the primary cause of the condition by freeing the ileal effluent. In the vast majority of cases the ulcer, which is the result of the distention of the duodenum, will get well without further treatment." My own experience has not gone that far, but I believe that freeing the bowel by this method will benefit the early stages of an ulcer. It is certainly a natural sequence to rest from irritation which the ulcer will receive by the freedom of the lower bowel from feces, and the consequent relief of the stagnation in the duodenum.

With Dr. Drowne a guest of the society, I do not wish to be too personal, but as in the case of Lane, when his article first appeared, I feel that he was misjudged, and often by those who had not taken the trouble to study his methods and their results more than very superficially. Certainly the evidences of relief obtained in many cases are surprising, and added to these are many more in which it may be premature to claim cures.

If these hypotheses are correct, why is it not much wiser to break up the fecal masses digitally and move on the offending excreta by a simple and purely mechanical method than to use irritating laxatives which, in many cases, do not touch the masses themselves, or immediately to resort to surgery. If the appendix or a Lane's kink is obstructing the lumen, this method will not give the results we see following their surgical removal, and in such cases, of course, surgery has to be resorted to.

The point I want to make is that hundreds of cases have responded, and do respond, to this treatment and have remained without symptoms after many months.

The work is aided by enemata and mineral oil, the only harm from which may be the absorption of the nitrogenous products if it is too long continued.

All patients cannot be handled the same way, but complete relaxation of the abdominal muscles is essential, and where this is difficult to obtain, the usual flexure of the thighs and head may be greatly aided by an occasional course of effleurage when unusual resistance is encountered.

This work cannot necessarily be done by anyone, but needs much practice and more patience before the tactile sense is developed sufficiently to bring the desired results.

REFERENCES.

[1] Maggiora: Archiv. Italienne de Biolog., Tome xvi, fasc. ii-iii.
[2] Graham, Douglas: Massage, 4th edit., p. 86 *et sub*.
[3] Lane, W. Arbuthnot: The Operative Treatment of Chronic Intestinal Stasis, 3d edit., 1915.

DISLOCATIONS OF THE SHOULDER, WITH A FEW COMPLICATIONS.

By F. F. Henderson, M.D., Boston.

[From the Out-Patient Department, Boston City Hospital.]

On examining thirty-two cases of fresh and old dislocations of the shoulder joint, with their x ray plates, it is obvious that the most common complication of the injury is a fracture or a stripping off of the greater tuberosity.

Out of thirty-two cases examined, nineteen show a fracture of greater tuberosity, three show fractures through anatomical neck, the remaining ten show apparently nothing by x-ray.

This paper is an attempt to demonstrate a few of these cases, with their history and treatment.

Before the day of x-ray, this complication was often overlooked, and now that we have x-ray plates before us, it is not always the easiest thing to interpret them correctly. We see now numerous patients, who, in the past, have had a dislocation of the shoulder, who are unable to get perfect motion. Any attempt at outward and upward motion causes severe pain. This is an important factor, as far as the patient is concerned, because of the inability to perform his duties normally. Cases in which we see nothing by x-ray are possibly due to an obscure chip of bone carried off by muscular attachment, and displaced so that it does not show in the plate, or perhaps due to traumatic arthritis.

There is in nearly every dislocated shoulder, after one month's duration, sometimes before a month, considerable arthritic change. All the bones in this neighborhood show a general thinning, with more or less proliferation, sometimes going so far as to produce exostoses, as is shown in the following plates:

Another rare complication is injury to the muscular spiral nerve, which will be demonstrated in one of the reported cases.

The motion most often complained of by the patient is the outward and upward. The failure to obtain this motion is due to the fact that, not only does arthritic change take place, but also the callous production resulting from fracture, and possibly stripping off of periosteum about the head of the bone, with callous production, all tending to obstruct outward and upward motion.

Paper hangers and painters are particularly subject to this kind of fracture, and it almost always prevents them from carrying on this kind of work.

Another observation that stands out very plainly in the history of these cases is the fact that in damp weather the trouble seems to be markedly increased. This, without doubt, confirms to a certain degree our idea regarding the arthritic tendency which these people have. Another obstruction we meet is the destruction of ligaments, of which the capsular ligament (the one that undergoes the most marked change) is the one for the repair of which we can do little or nothing.

Case 1. Through the courtesy of Dr. Arthur Kimpton, I am able to show this plate of an old dislocated shoulder with fracture and dislocation of greater tuberosity, with marked stripping and proliferation of periosteum forming large exostoses extending over the scapula. Another notable change is a marked transparency of the head of the humerus, with outer end of clavicle and acromion process.

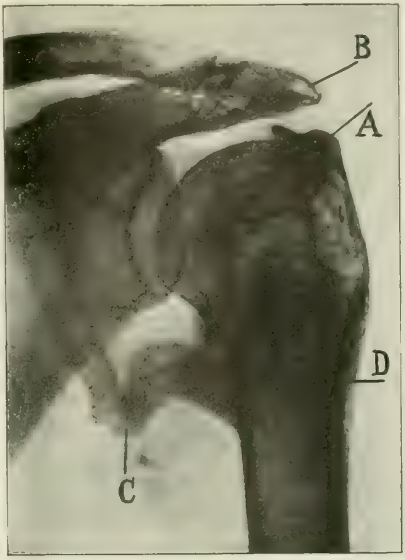

Plate I. Case 1. *A* Fractured and displaced tuberosity. *B* - General thinning of the acromion process with outer end of clavicle. *C*—Exostosis. *D* -Proliferation of periosteum.

Case 2. On March 25, 1916, patient fell downstairs, landing on his left shoulder, which was dislocated. A physician attempted reduction, without success, after which he was referred to the Out-Patient Department of Boston City Hospital. Examination shows him to have a subcoracoid dislocation of the left humerus. Reduced under anesthesia. Axillary pads and shoulder cap applied. Arm fixed to side with adhesive, arm and hand suspended in sling. X-ray shows head of humerus to be in normal position, with chipping off of a part of the greater tuberosity.

April 8, apparatus removed. Patient received

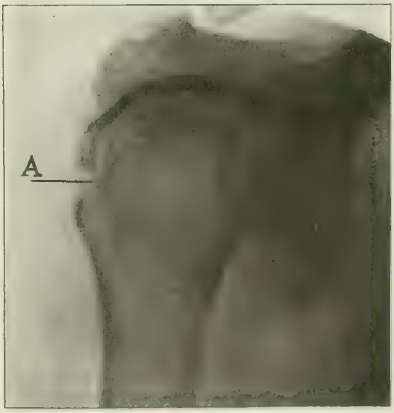

Plate II. Case 2. Fractured dislocation of greater tuberosity with an unrecognized fragment which has been carried out of sight by muscular attachment.

slight passive motion, with much pain and limitation of motion; apparatus reapplied. April 17, all apparatus removed. Complains of severe pain on the least possible motion. Gentle passive motion with use of alcohol and hot fomentations to shoulder at home. Arm suspended in sling.

April 24, all pain and tenderness greatly improved, but still severe pain and tenderness on extreme motions. Massage every second day.

CASE 3. J. B. Patient said to have fallen downstairs, dislocating his right shoulder; referred by his physician to the Out-Patient Department of the Boston City Hospital. On examination, presents subcoracoid dislocation. Reduced under anesthesia; arm put up in sling in usual way.

Dec. 27. X-ray shows head of humerus in normal position, spicular bone torn from greater tuberosity. On Jan. 4, 1917, apparatus readjusted. Jan. 11, 1916, gentle passive motion; apparatus reapplied. Jan. 18, all apparatus removed, patient complains of severe pain on slightest motion; double sling applied. Patient advised to use slight passive motion and massage at home, also to receive massage and electricity at the Hospital. Feb. 2, 1916, pain, tenderness and motion all greatly improved. All dressings removed; advised to continue with same treatment. March 28, 1916, condition slightly improving; to continue with same treatment. May 12, 1916, all motions greatly improved; same treatment. May 12, 1916, all motions greatly improved. Slight pain. July 6, 1916, condition of arm about the same.

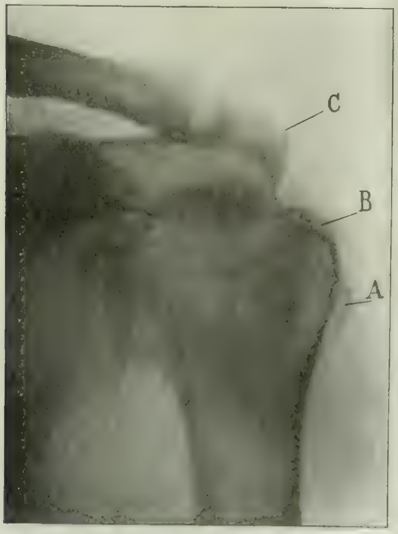

PLATE III. CASE 3. A—Small bit of periosteum [illegible] changes. B—Old fractured tuberosity. C—[illegible] the bony changes (hypertrophic arthritis).

CASE 4. J. G. Patient states he fell on the ice. On extending his left arm, to break his fall, he received a dislocated shoulder. He called to see his own physician, who advised hospital treatment. Entered Accident Department of the Boston City

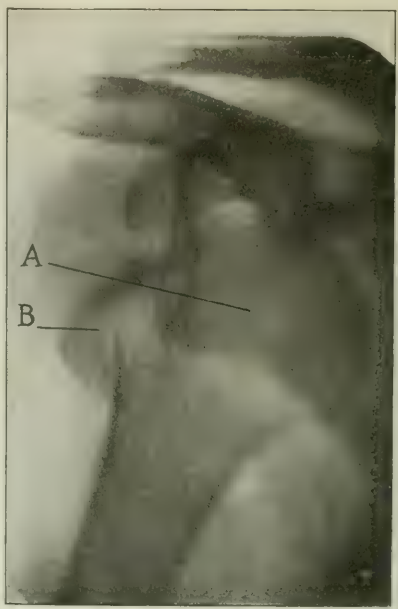

PLATE IV, A. CASE 4. A—Dislocation of head. B—Fracture of greater tuberosity.

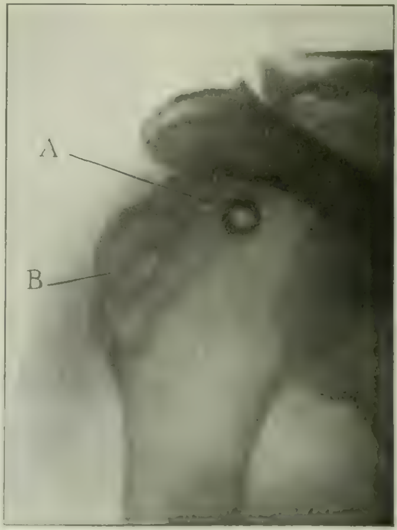

PLATE IV, B. CASE 4. A—Showing head of bone in normal position. B—Fracture of greater tuberosity, with slight displacement.

Hospital, where, on examination, showed a subcoracoid dislocated, reduced by Kocher method. Apparatus applied as in the above case. Feb. 9, complains of severe pain on slightest motion. On Feb. 16, one week later, pain slightly diminished. Limitation of motion as above. On Feb. 23, motion slightly improved, considerably less pain. Receives slight passive motion, all apparatus omitted, save for sling. Advised to use slight passive motion and to apply alcohol and hot fomentations at home. March 1, slight improvement since last visit. All apparatus omitted; massage, electricity, passive motion. Patient two weeks later shows considerable improvement, still far from normal, extreme motion producing severe pain.

Case 5. Patient states that on Jan. 23, while wrestling with a friend, she had her arm twisted, receiving a dislocated shoulder. She came directly to the Out-Patient Department of the Boston City Hospital. Examination shows her to have subscapular dislocation of the shoulder, with a slight crepitus over head of bone. Reduced under anesthesia. Axillary pad applied to shoulder. Arm held to side with adhesive. Arm and hand suspended in sling. Jan. 24, x-ray shows head of humerus to be in normal position, with fracture and dislocation of greater tuberosity, which apparently is carried up into the joint.

Consultation with Dr. F. B. Lund, who advised immediate operation. Patient returns for operation on Jan. 27, 1916. Incision made over seat of fracture; the entire tuberosity found to be imbedded in joint. Bone replaced to normal position, and held in place by three wire nails. Wound closed in usual way. Dressing applied, axillary pad, shoulder cap and arm held to side by adhesive. Arm and hand supported by sling. After remaining one week, was discharged to return to Out-Patient Department. On Feb. 5, returns to Hospital; wound found clean and entirely healed. General passive motion, Feb. 11, 1916; all apparatus removed. Patient receives gentle passive motion, with a great deal of pain. Arm suspended to side by double sling. X-ray shows tuberosity to be in fair position. Feb. 18, sling removed. Patient complains of severe pain on slightest motion. Sling reapplied.

Feb. 25, all pain and tenderness considerably less; motions improving very slowly. Advised to use passive motion at home, and hot fomentations to shoulder, with massage and electricity at Hospital every other day.

On March 10, 1916, still complains of severe pains, and tenderness in shoulder. All motions steadily improving. Patient is using arm daily around house, but unable to extend arm to head. Advised to continue with same treatment.

April 10, 1916, patient has less pain in shoulder, most marked pain in attempting to use arm in the morning. Motion still slowly improving.

June 8, 1916, patient has practically no pain save on extreme motion.

July 15, 1916, still has pain on extreme motion; manipulation of arm causes excessive pain.

Advised to massage arm, and attempt ladder climbing, with disabled arm.

Aug. 28, 1916, motions of arm markedly improved. To continue with same treatment. On Oct. 28 condition remains about the same, with possibly a slight improvement. Still having considerable pain on extreme motion.

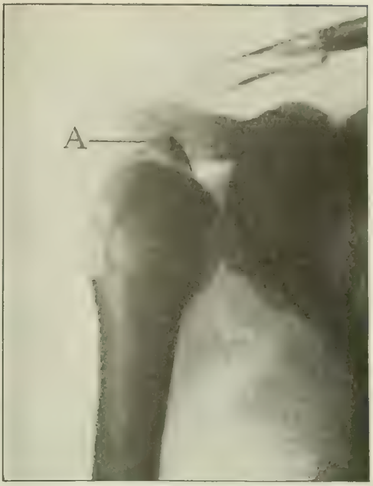

Plate V. Case 5. *A* Showing fracture of greater tuberosity, with displacement of fragment into joint before operation.

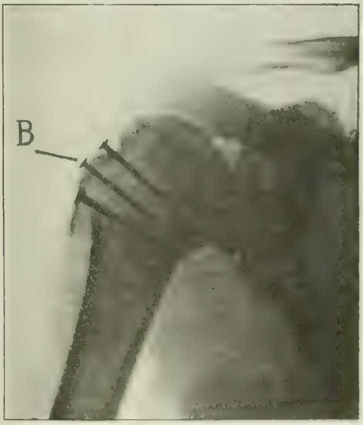

Plate V. Case 5. *B* Showing fragment in fair position, held in place with three wire nails.

Case 6. L. M. Patient states he fell through hatch hole in ship, dislocating his left shoulder. He was taken to the Haymarket Relief Station, where a dislocated shoulder was found.

Reduction without anesthesia, on Aug. 4, 1916. Aug. 5, x-ray shows head of humerus to be in normal position, with fracture of greater tuberosity with slight displacement of fragments. Fracture put up in ordinary way. Aug. 12, 1916, apparatus readjusted. Aug. 21, all apparatus removed, slight passive motion; apparatus reapplied. Aug. 29, all apparatus removed.

Patient complains of pain in shoulder joint on slightest possible motion. Arm fixed to side with double slings. Sept. 5, patient still has considerable pain on passive motion. Arm suspended in sling. Referred to massage department, also electrical, and to use hot fomentations and passive motion at home.

Sept. 12, 1916, pain and tenderness much reduced, with motions slightly improved; sling omitted. Advised to use arm, and continue treatment. Sept. 24, pain, motions, and tenderness steadily improving; advised to continue with same treatment at home, and at hospital, with the addition of ladder climbing. Oct. 18, 1916, patient still has pain in shoulder on extreme motions; advised to continue with same treatment.

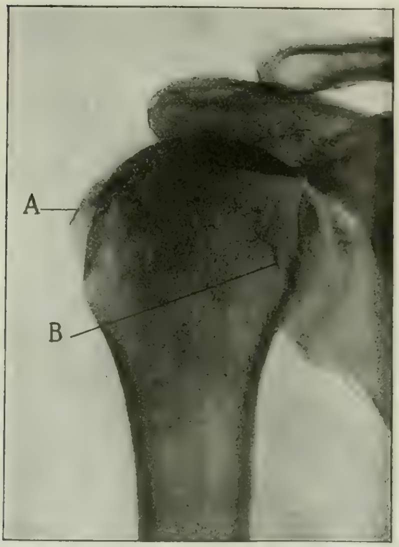

Plate VI. Case 6. *A* Shows fracture of greater tuberosity. *B* Comminuted fracture of head of humerus.

Case 7. M. S. Patient states that on July 29 he tripped, and caught his heel, throwing him headlong against a rock. On attempting to break his fall he dislocated his right shoulder. His physician reduced the dislocation without anesthesia by Kocher method, after which arm was bound to side with double sling.

Reports to Out-Patient Department of the Boston City Hospital one week later. X-ray shows fracture of greater tuberosity. Arm shows marked limitation of motion. Patient unable to raise his arm above 45°. On arriving at this point he complains of severe pain in shoulder joint, also pain radiating from shoulder down over deltoid muscle to posterior surface of arm.

Axillary pad, shoulder cap, arm fixed to side by applications of adhesive plaster. Hand and arm supported by sling. Returns to Hospital one week later with less pain on motion; limitation of motion remains about the same as previous week.

All apparatus reapplied; returns to Hospital one week later. Aug. 9, pain less severe, motions slightly improved; apparatus all removed, save for sling.

Received gentle passive motion; advised to use same motion at home, with application of alcohol, and hot fomentations to shoulder.

Aug. 27, patient returns with slight improvement. On Aug. 28, he received massage, passive motion, and electricity. This last treatment he received every other day for one month, without any noticeable improvement, save for possible increase of motion.

At the end of three months, with almost continual hospital treatment, and massage at home, patient is able to raise his arm to about 80°.

At the end of one year still lacks his normal motion, and complains of pain in shoulder upon rising in morning, which lasts until he has used his arm an hour or so.

Case 8. J. D. Patient states that on March 25, 1916, he fell downstairs, landing on his left shoulder, from which he received a dislocated shoulder. Patient called in his own physician, who attempted reduction, without success, after which he was referred to the Out-Patient Department of the Boston City Hospital. Physical examination showed him to have subcoracoid dislocation of left humerus. Under anesthesia dislocation was reduced. Axillary pad and shoulder cap applied, arm fixed to side with adhesive. Arm and hand suspended in sling. X-ray shows head of humerus to be in normal position, with chipping off of a part of the greater tuberosity. April 1, patient returns; apparatus readjusted. April 8, patient receives slight passive motion, with much pain and limitation of motion.

April 17, all apparatus removed. Patient com-

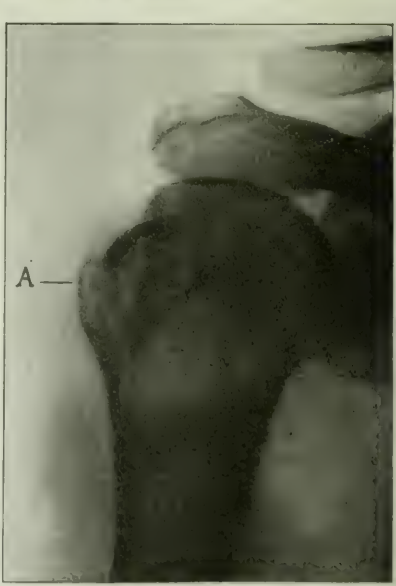

Plate VII. Case 8. *A* Fracture of greater tuberosity.

plaining of severe pain on the least possible motion. Gentle passive motion, with advice to use alcohol and hot fomentations to shoulder at home. Arm suspended in sling.

April 24, pain and tenderness reduced; all motions much improved, but still severe pain and tenderness on extreme motions.

Referred to massage department, where he received massage every other day .

TREATMENT.

The treatment of these cases is not always an easy one, because of the marked inability, and obstruction to anything near normal motion. They require a long, tedious course of treatment, the end of which is not always pleasing to the operator.

The x-ray is of the utmost importance in determining between simple dislocation or dislocation with fracture. I have already shown that the majority of dislocated shoulders are accompanied by fracture of the greater or lesser tuberosity.

The operative cases are those in which a large fragment is torn off, and displaced so that the normal position of the arm will not reduce the fragment to a point near that from which it was detached. In such a case the fragment is reduced by open operation, held in place by ordinary wire nails.

Smaller fragments which are torn off and carried into the joint, where they offer obstruction to motion, are removed by open operation.

Exostoses which form as a result of stripping of the periosteum are also removed as above. In all cases where an operation has been performed for removal of obstruction to the outward and upward motion, the arm is put up as high as possible, and retained in this position by a plaster cast, which should be cut at the end of two and one-half to three weeks, when the patient should receive a slight amount of passive motion; this treatment to be continued from four to five weeks.

Fractures without any marked displacement may be treated satisfactorily by the ordinary method of placing the arm to the side, applying a shoulder cap and double sling. The dressing is allowed to remain in this position from two to three weeks, when apparatus is removed, and they receive gentle passive motion every third day until the end of the fourth week, when all apparatus is omitted.

The operative and non-operative cases all receive massage and electricity, with passive motion, every other day, and are instructed to attempt ladder climbing or slight pulling on a rope above the head. There is still another class in which we see no fracture by x-ray at the time of injury. Many of these cases are treated as uncomplicated dislocations, but later, in the course of weeks or months, return to the clinic with inability to get anywhere near perfect upward and outward motion.

The x-ray of such cases usually shows a great deal of thickening about the joint surfaces, with marked proliferation about the greater tuberosity, and also an acromion process.

Another noticeable change is general thinning of all bones in this region. The treatment of such cases is very difficult because of the long duration, and marked proliferation causing obstruction.

Such cases should receive a fair trial on ordinary treatment, such as massage, electricity, and extreme passive motion. If satisfactory result is not obtained, the arm should be manipulated under ether, and put up in extreme extension and plaster, and allowed to remain from two to three weeks, then treated as any ordinary operative case, as stated above. In the above cases you will notice by the description of the x-ray that there is considerable arthritic change which has taken place, apparently stimulated by trauma.

Muscular spiral injury to these cases is rather rare, but does occur, and is well looked after, usually by massage and electricity.

The nailing of fragments in or near joint surfaces has apparently no ill effects in the motion of the joint, following such procedures as recommended in an article written by Dr. Arthur T. Mann, of Minneapolis, published in *The Journal of the American Medical Association*, Oct. 14, 1916.

Dr. F. B. Lund, of Boston, also has cases and x-rays which affirm this method of treatment.

THE ETIOLOGY AND PATHOLOGY OF PERFORATING GASTRIC AND DUODENAL ULCERS.*

By Franklin W. White, M.D., Boston,

Instructor in Medicine, Harvard University; Visiting Physician, Boston City Hospital.

We are dealing with the complication of ulcer, which is the most dangerous, and requires the most prompt attention.

Type.—The usual text-book statements refer almost entirely to acute, and occasionally, subacute perforations. This is the least common kind. New data are just appearing—thanks to the use of the roentgen ray—which show that we have another type of perforated ulcer, namely, the *chronic* perforations, which are twice as common and much less dangerous.

The pathology of acute perforation is well known. In the chronic perforations of the ulcer we have a leisurely destruction of the coats of the stomach or duodenum, and by the time the stomach wall is eaten through, the site is protected by lymph, adhesions and induration, and general peritonitis rarely occurs, and only occasionally a local abscess, sub-diaphragmatic or otherwise. The location of the perforated ulcer is about equally often in the stomach and duodenum.

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* Read before the Massachusetts Society of Examining Physicians, January 26, 1917.

Location.—The acute perforations are largely at the pyloric end of the stomach and almost all on the anterior wall of the stomach, usually nearer the lesser than the greater curvature. In the duodenum the acute cases are almost all on the anterior wall.

The chronic perforations are found in the stomach most frequently at the common site of chronic ulcer, namely, along the lesser curvature and near the pylorus, and in the duodenum near the pylorus.

The chronic perforations are easily seen with the roentgen ray and, of course, are the only type which the radiologist sees or describes. They show as little canals, or buds or pouches growing out of the lesser curvature of the stomach or of the duodenum. They are definite and characteristic. Chronic perforations can be discovered only by the use of the roentgen ray or by operation. We must be careful in looking at the roentgen picture not to confuse the narrow crater of an ulcer with a true perforation. We must remember the thickness of the stomach wall caused by induration and infiltration. We may have a deep crater without going through the wall. In the duodenum we may have much irregularity of the first portion without an actual perforation. Ordinarily, however, there is no real difficulty in distinguishing a perforated ulcer from one with a deep crater.

Carman has called attention to the fact that if the ulcer is high up on the anterior wall or lesser curvature, it tends to perforate against the liver and the little pouch can be seen to move with respiration. If the perforation is low and posterior, for example, into the pancreas, it does not move with respiration.

Frequency.—Chronic perforation of ulcer is common; in 74 cases of chronic ulcer of the stomach and bowel which I have seen and in which a careful roentgen examination was made, there were nine cases of chronic perforation, 5 gastric, and 4 duodenal, namely, about 12%. In reading this per cent., we must remember that this does not by any means hold true for *all* ulcers, but gives the per cent. of chronic perforations in a group of rather serious chronic cases seen by a consultant. Recent figures from The Mayo Clinic, where the material is more definitely surgical, are even higher; namely, a little over 17% of chronic perforations in gastric and duodenal ulcer.

Eusterman's[1] figures on perforated duodenal ulcers show that out of over one thousand ulcers (778 duodenal and 324 gastric) 28% of the duodenal, and 25% of the gastric, perforated. Of these, 17% of the duodenum were chronic, and 9% acute and sub-acute; and of the gastric, 19% were chronic and 6% acute and sub-acute. In short, taking the stomach and duodenum together, there were about twice as many chronic as acute perforations in the stomach and duodenum.

Symptoms.—We will leave the discussion of the symptoms, diagnosis and treatment of *acute* perforation to our surgical colleagues. The acute, violent pain, the abdominal rigidity and tenderness, the rapid pulse, and the signs of peritonitis are well known. Also the difficulty in distinguishing an acute perforated ulcer from appendicitis, acute pancreatitis, or disease of the gall-bladder. In the sub-acute cases the symptoms are similar but less severe and acute.

In the cases of chronic perforation there are no characteristic symptoms beyond those of a chronic ulcer of the stomach or duodenum, unless the perforation extends and forms a deep abscess. This is unusual, as the perforation is ordinarily thoroughly walled in and limited by dense adhesions. We cannot distinguish an ulcer with a chronic perforation from a simple chronic ulcer save by the use of the roentgen ray.

The course of an ulcer is highly individual. We cannot tell in a given case whether or not the ulcer will heal, will become chronic, will perforate, or will develop cancer.

The medical treatment of chronic ulcer, including perforations, depends on these fundamental questions:

What are the causes of ulcer of the stomach and duodenum?

What prevents their healing?

What are the immediate causes of perforation?

What can we, as physicians, do to heal peptic ulcer and prevent perforation?

Cause.—Most of the recent work points to infection as the cause of ulcer. Bacteria are found in the ulcers and in the deep lymphatic glands. Ulcer is frequently associated with other infections such as the gall-bladder or appendix, or chronic foci of infection about the teeth, tonsils and nose, and evidence is increasing that ulcers may also be due to toxines from infections elsewhere in the body.

Various men have produced ulcer of the stomach by infection with bacteria, such as colon bacilli, pneumococci, etc. Some of the most clean-cut and recent experiments were made by Rosenow,[2] who injected dogs and rabbits with streptococci from ulcers of the stomach and duodenum of man, and produced ulcers of the stomach and duodenum in 60-70% of the animals injected.

Healing.—What retards or prevents healing? Probably 75% of acute ulcers heal. We deal with the 25% which do not heal, but which recur and become chronic. Why does this occur? Experimental ulcers[2] produced by streptococci, pneumococci or colon bacilli heal rapidly. Hamburger[3] has recently shown that acute ulcers in dogs heal normally in two or three weeks. In those with artificial pyloric stenosis with associated hyperacidity or hypersecretion the ulcers remain unhealed at the end of eight weeks or more and the ulcers are worst when the emptying of the stomach is slowest. Position also is important. Acute ulcers of the fundus healed quickly and only those close to the pylorus were uniformly unhealed. These experiments emphasize slow emptying of the stomach, hypersecretion and position near the pylorus as the important factors which prevent the healing of an ulcer.

Immediate Causes of Perforation.—It is frequently stated that a strain or wrench, or muscular effort or heavy meal may be the immediate cause of a perforation. A heavy muscular effort will, without question, increase the pressure within the hollow organs of the abdomen, including the stomach. A sudden blow may, also, compress the stomach between the front and back wall of the abdomen and greatly increase pressure within the stomach. Even active peristalsis may increase the pressure near the pylorus for a short time. This increased pressure may break through a weak spot in the wall.

As a matter of fact, about two-thirds of the acute perforations actually take place at night, when the patient is quiet or in bed. Other perforations, which take place in the daytime, may simply occur *during* work, but not necessarily as a result of it.

In one case which I saw, where symptoms of perforation of a deep gastric ulcer followed a few hours after the use of the stomach tube, the first thought was that the tube had caused the perforation. At operation, which was immediately done, an ulcer was found on the anterior wall of the stomach near the pylorus with a deep, narrow crater, too narrow for a tube to get into it; the bottom of the ulcer consisted of a paper-thin layer of peritoneum, with a small, round hole in the middle of it. The smooth, round hole suggested erosion, not a tear from violence, and the perforation seemed to follow the patient's dinner rather than the tube.

There are individual anatomical and mechanical factors in every case, such as the depth and position of the ulcer, the thinness of its base, the presence or absence of adhesions, which largely determine the time and mode of perforation.

Treatment.—The key-note of medical treatment in such cases is prevention. We must try to heal the ulcer and prevent perforation. This is not the place to enter into the details of medical treatment. I will briefly state the principles.

We must treat the patient, as well as the ulcer, and remove all foci of infection in the mouth, throat and nose, appendix or gall-bladder.

The local treatment of ulcer should be thorough, systematic and detailed, like the treatment of diabetes; half-way measures give poor results. The principles of this treatment are as follows: Be sure that the stomach empties promptly, greatly lessen or remove all free acid by the use of suitable drugs and foods, and lessen mechanical irritation so far as possible by a bland diet. Gastroenterostomy succeeds just in so far as it does these things. Thorough systematic medical treatment along these lines will heal ulcer of the stomach and duodenum and prevent perforation in more than one half of the cases.

In some absolutely latent cases of ulcer it is impossible to prevent perforation. I recently saw one such case in a physician in whom the first symptom of any indigestion was the perforation of a duodenal ulcer.

REFERENCES

[1] Eusterman: Incidence and Diagnosis of Complicating Factors in Gastric and Duodenal Lesions. Results in 1900 Cases Operated Upon. Am. Jour. of Gastroenterology, January, 1914, pp. 111-118.

[2] Rosenow: Elective Localization of Streptococci. Jour. A. M. A., 1915, Vol. lxv, pp. 1687-1691.

[3] Hamburger: Experimental Studies in the Production of Chronic Gastric Ulcer. Lancet-Clinic, March 6, 1915.

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ON THE USE OF THE EMANUEL-CUTTING MASTICHE TEST IN EXAMINING SPINAL FLUID FROM PSYCHOPATHIC SUBJECTS.*

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AND

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In 1915, one of us (Lowrey)[1] investigated the Emanuel mastiche test on the spinal fluid of the insane. At that time the conclusion was drawn that the test was not a valuable addition to our diagnostic armamentarium. This conclusion seemed justified by the fact that there was difficulty in determining what was a positive reaction, and the positive reactions did not check with other tests in the spinal fluid. Recently Cutting[2] has published an article in which he proposes a slight modification of the original Emanuel test and states, as a result of his examination of two hundred spinal fluids, that the test is of considerable value in the diagnosis of syphilis of the nervous system. His table shows no cases diagnosed as paresis, cerebrospinal syphilis or tabes giving a negative mastiche, although fourteen of this general group gave a negative Wassermann. Further, he has no non-syphilitic cases with negative Wassermann tests which gave a positive mastiche.

Accordingly, it seemed to us desirable to reinvestigate the test according to the modification proposed by Cutting. His method is as follows:

"A stock mastic solution is made by dissolving 10 gm. of gum mastic in 100 cc. of absolute alcohol.

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* Contribution of the Massachusetts Commission on Mental Diseases, No. 195 (1917.15).

and then filtering. This stock solution keeps indefinitely if well corked. To 2 cc. of this solution 18 cc. of absolute alcohol are added, and insufflated rapidly into 80 cc. of distilled water. This makes an emulsion of mastic which is opalescent when held to the light. This solution can be used immediately or after several days; indeed, the reactions seem to be more easily read when a solution is employed which has stood for at least a few hours.

Next, a 1.25% sodium chlorid solution is made with distilled water, and to each 99 cc. of this salt solution is added 1 cc. of a 0.5% solution of potassium carbonate made up with distilled water.

Then six small test tubes are placed in a rack. These tubes should have been washed thoroughly in tap water, then in denatured alcohol, to remove any old mastic adhering to the sides of the tubes, rinsed in distilled water and dried, conveniently in a hot-air oven. To the first tube 1.5 cc. of the combined salt and potassium carbonate solutions are added, and to the other 1 cc. each. Then 0.5 cc. of spinal fluid is added to the first, and, after thorough mixing, 1 cc. is transferred from the first to the second, 1 cc. from the second to the third, and so on, the last cubic centimeter that remains over from the next to the last tube being thrown out, and no spinal fluid being put in the control. Now to each tube, 1 cc. of the mastic solution is added and stirred thoroughly with a glass rod, care being taken to wash the rod with distilled water before going to the next series. It is best to finish each group before beginning another.

The racks are set away, and in from twelve to twenty-four hours the end-results can be read. If the racks are placed in an incubator at 37.5° C., the precipitation is complete in from six to twelve hours."

We have tested the fluids from 268 patients admitted to the Psychopathic Hospital. Of these, 74 fall into the general group of syphilis of the nervous system, the majority of the remainder being non-syphilitic psychopaths and non-psychopaths, with the addition of three cases of acute meningitis. The results are presented in tabular form in Table I.

TABLE I.

RESULT OF THE MASTICHE TEST IN 268 SPINAL FLUIDS.

Classification	No.	W. R. Blood	Gold	Mastic
Paresis	54	+	+	+
Paresis	13	—	+	+
Neurosyphilis	6	+	+	+
Tabes	1	+	+	+
No psychosis	9	—	—	—
Dementia praecox	34	—	—	—
Dementia praecox	1	+	—	—
Manic depressive psychosis	23	—	—	—
Manic depressive psychosis	1	+	—	—
Manic depressive psychosis	4	—	+	—
Paranoia	9	—	—	—
Unclassified	20	—	—	—
Unclassified	1	—	+	—
Unclassified	1	+	—	—
Arteriosclerotic	6	—	—	—
Arteriosclerotic	2	—	+	—
Feeble-minded	26	—	—	—
Feeble-minded	1	+	—	—
Feeble-minded	2	—	+	—
Epilepsy	11	—	—	—
Traumatic	2	—	—	—
Meningitis	3	—	+	+
Alcoholic psychosis	10	—	—	—
Chronic alcoholic	9	—	—	—
Chronic alcoholic	1	+	—	—
Psychopathic personality	16	—	—	—
Chorea	1	—	—	—
Toxic psychosis	1	—	—	—

In all of our cases the following tests were made: Wassermann test in blood and spinal fluid; albumen, globulin, cell count and colloidal gold tests in spinal fluid.

We have recorded all tests as + or — in the table, and have compared only the Wassermann and gold reactions. While a more elaborate analysis is possible it seems unnecessary for the purposes of this paper.

A normal fluid causes no change in the mastiche test solution in any tube. The control tube does not precipitate, as was the case using the original method. Between the unchanged and the maximum change, *i.e.,* complete precipitation with clear supernatant fluid, we may recognize certain gradations. Thus in many cases there is produced a very marked clouding, through which light is not transmitted. In another type, light is very faintly transmitted. Again, there may be a perceptible clouding with fairly good transmission of light. Finally, there may be a change so faint that it is recognizable only on comparison with the control. These changes can be noted by the number system, as in reading the gold reaction. We then have a series, ranging from 5 to 0, and can compare mastiche and gold curves, if such exist.

Because of certain technical facts, our comparisons cannot always be exact, hence no general table of comparisons is introduced, but, instead, we shall compare certain types of reaction with one another.

We have regarded as positive all cases showing marked clouding in 2 or more tubes. Some of our fluids tested fresh have shown precipitation, and after some stay in the ice-box have shown only clouding. In positive cases, the test solution becomes very cloudy immediately upon adding the mastiche. (See Figs. 1 and 2.)

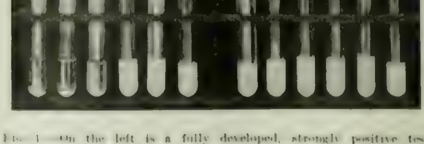


FIG. 1.—On the left is a fully developed, strongly positive test (paresis). On the right is a positive (very heavy clouding) test from a meningitis case. The right hand tube in each set is the control.

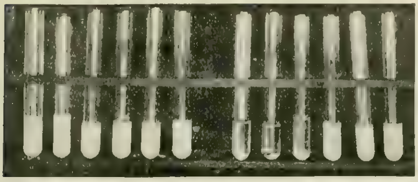


Fig. 2.—Both tests were made on the same fluid. The tubes at the left were set up about 15 minutes before the photograph was taken; on the right, 12 hours earlier. In the tests there is a marked difference between the control (clear) and other (cloudy) tubes. This does not show in the photograph.

An examination of our material shows that 48 of the positive cases showed precipitation. Practically all fresh fluids giving a strong paretic curve with the gold showed precipitation with mastiche.

As types, we may quote the following:

Gold		Mastiche
5 5 5 5 5 4 3 0 0 0	:	5 5 5 4 4 0
5 5 5 5 4 3 2 0 0 0	:	5 5 4 3 2 0
5 5 5 4 3 2 1 0 0 0	:	4 4 3 0 0 0

Cases of vascular neurosyphilis have given us weaker reactions with mastiche:

Gold		Mastiche
3 3 2 1 0 0 0 0 0 0	:	3 3 2 1 0 0
3 3 2 2 1 0 0 0 0 0	:	3 3 2 1 0 0
3 4 3 1 0 0 0 0 0 0	:	2 2 1 1 0 0

This is also true of the treated cases—where the gold reaction has become weaker, the mastiche reaction is also weaker. Thus in one case, the gold had come down to 0 0 1 2 2 2 2 1 1 0; mastiche 3 3 2 1 0. In one treated case, ventricular fluid gave a negative gold and a weakly postitive mastiche reaction.

We had three cases of acute non-syphilitic meningitis. In these cases neither the gold nor the mastiche reaction is of differential value. Of these the following is a type:

Albumen + + +; Globulin + + +; Cells 2000
Gold: 3 3 4 3 4 4 3 5 2 2; Mastiche: 4 4 3 3 0 —

It is well known by those who use the gold test that there is a fairly marked variation in reagent sensibility. Lowrey[3] has called especial attention to this point. Care and experience are required in making the reagent and *interpreting* the results. The mastiche reagent is simple and the interpretation is easy. Furthermore, it seems to be very accurate. Of a number of cases showing a positive gold (other tests negative), the following will serve as a type.

On the first examination all tests were negative except the gold, which read: 5 4 3 3 3 3 0 0 0 0. The mastiche was negative. On second testing, the gold (new reagent) was negative.

Because of these facts, it seems to us that the mastiche test, as modified by Cutting, has a distinct place in the clinical laboratory. Because of the ease and accuracy of examination it may well be used to determine in which cases the more complicated gold test should be done.

Our experience indicates that the test does not differentiate between lues and acute meningitis; hence the chances are that the reactions in tubercular meningitis and tumors will not be differential.

We feel that the facts presented in this paper demonstrate the accuracy and value of the mastiche test, and justify the conclusion that it has a place in the examination of spinal fluids, especially where, as is the case in this hospital, large numbers of spinal fluids are examined (about 40 a week). In all cases showing clouding with mastiche, a gold reaction should be performed as a final check.

REFERENCES.

[1] Lowrey, Lawson G.: Two New Cerebrospinal Fluid Tests, Boston Medical and Surgical Journal, Vol. clxxvii, 1917.

[2] Cutting, James A.: A New Mastic Test for the Spinal Fluid Jour. A. M. A., Vol. lxviii, p. 1810, 1917.

[3] Lowrey, Lawson G.: Cerebrospinal Fluid Tests, Especially the Gold Reaction, in Psychiatric Diagnosis. Jour. Nerv. and Ment. Dis., Vol. xlvi, 1917.

Clinical Department.

BOTULISMUS: REPORT OF TWO FATAL CASES.

By René Bine, M.D., San Francisco.

The increasing frequency of reports of cases of botulismus naturally leads to the belief that with an increased knowledge of symptomatology, more cases are being correctly diagnosed and recorded. The occurrence of botulism in California has been described by Dickson, the poisoning in his collection of fatalities having been due, with two exceptions, to eating vegetables or fruit which had been canned at home.

The bacillus botulinus has also been found in canned meats, canned fish, in sausages and in meat pâtés, which have caused typical symptoms of poisoning.

The following report concerns two cases where death followed the drinking of clam juice. As is often the case, the cause of death of the first patient was not discovered until the second instance of illness became known.

Case 1. The patient, a barkeeper, aged 44 years, had worked as usual until late Saturday night, Oct. 25, 1913. On the morning of the twenty-seventh he awakened at the usual time and, to his surprise, discovered that he was unable to swallow. Two physicians saw him that day, and on that evening he was removed to the hospital, presenting no signs other than his inability to swallow or move his tongue. Intestinal symptoms were absent.

Seen in consultation on Oct. 28, 1913, at 9 A.M., the following was noted: He was well developed and well nourished, with sensorium clear, and was able to make himself understood in response to questions by slight movement of his head. The tongue could not be moved. There was no involvement of facial muscles. The patient was unable to sit up alone, and his head dropped forward on chest or backward, according to change of position. All extremities were paretic; he was unable to resist passive motion, though able to move limbs very slightly. Pupils were very small and no reaction was elicited. There was definite lateral nystagmus of left eye; otherwise no demonstrable disturbances of eye muscles. Reflexes: triceps, biceps and knee-jerks were normal. Pharyngeal reflex, Oppenheim, abdominal and cremasteric reflexes were absent, with a question as to the left Babinski. Heart was normal, with full and slow pulse. Blood pressure 160. Lungs, abdomen, glands, etc., showed nothing of importance.

The patient admitted drinking daily 20 to 30 drinks of mixed variety. We were unable to get a history of his drinking anything different from what was his daily custom. It was thought that we were dealing with an acute, rapid, progressive bulbar paralysis, due either to poison ingested or to hemorrhagic softening of the pons and medulla, possibly on a syphilitic basis, in spite of there being no evidence warranting the diagnosis of lues. The prognosis seemed bad. It was felt that the patient could live but a few hours. Blood and spinal fluid were to be removed for examination that afternoon, but the patient died, in spite of the usual treatment, including artificial breathing, a few hours after our visit.

The case was reported to the coroner by the attending physician, the record showing that death had resulted from chronic myocarditis and parenchymatous nephritis. The case was not inquested.

Case 2. A day or so after seeing Case 1, a medical friend of mine was telling me of an interesting case that he had seen. A neighbor of his, male, aged 24, had been taken sick with gastro-intestinal symptoms a couple of days after having partaken of clam juice served by a barkeeper who had since died. Except for slight symptoms, there was said to have been no after-effects in this case. On November 9, however, the patient was again taken quite sick and was seen by me, at 8 P.M., in consultation with the above-mentioned doctor.

The patient was found in bed, perfectly conscious, but hardly able to speak. The tongue could be protruded but very slightly. Breathing was rapid and shallow and the expression anxious. Pulse was small, weak, 140. Except for bilateral ptosis, the eye muscles were apparently normal. Ophthalmological examination was negative. Knee-jerks, abdominal and plantar reflexes were equal on the two sides. Motor power of the extremities was not impaired. Heart was normal and rapid. Lungs were negative, except for faint pleuritic rub at right axilla.

The patient was removed to a hospital in order to give him the advantage of the best of nursing and modern appliances, pulmotor, etc., but he succumbed at 2 A.M.

A third man also took some of the clam juice, but, except for slight gastro-intestinal symptoms, remained well.

A LONG UMBILICAL CORD, CAUSING THREE LOOPS AROUND THE NECK.

By M. J. Konikow, M.D., Boston.

An umbilical cord that was about 97 cm. long, and was coiled around the neck of a fetus three times, is such a rare occurrence that its report may be justified.

The particular cord belonged to a male child, born on May 14, 1917, to a 39-year-old quintipara. Except for the third stage, which, due, undoubtedly, to the condition of the cord, was somewhat prolonged, the delivery ran the usual normal course. It was a left occipitoanterior presentation, with the total labor lasting about 13 hours. Child weighed 8¾ lbs. and was slightly longer than usual. In spite of the three coils, which I easily succeeded in pulling down, one by one, over the born head, I had no trouble with the child's respiration. He cried lustily immediately after his birth.

Coiling of an umbilical cord around the neck or any other part of a fetus is so common that it was accepted by some prominent obstetricians, like Michaelis, Schroeder and Simpson, as a normal position of the cord. This view, however, is hardly shared by later or present obstetricians. Roughly speaking, the coiling occurs in one out of every four or five deliveries. One coil is the most frequent occurrence, two coils are rare, three or more coils are very rare. From my own obstetric experience, which approximately embraces about one thousand cases, this was my first case of an umbilical cord with three coils around the neck of the fetus.

In consulting the literature upon the subject, I find that some authors had reported even greater length of the umbilical cord and a greater number of its loops around the neck. So Karl Holzapfel[1] reported a case of a true knot, where the length of the umbilical cord reached 118 cm. Gottschalk[2] reported a case of a delivery, in a breech presentation, where the head was firmly held by a sling of the umbilical cord, the length of which was 92 cm. Strassman[3] saw a case where the umbilical cord was wound five times around the neck. Hamill[4] reported a case where the umbilical cord encircled the arm twice and the neck four times. Even as many as seven coils around the neck, with an umbilical cord 168 cm. long, had been observed and described by Wygodzky, as cited by A. Maener.[5] And yet it remained for R. M. Beach[6] to report a case of fetal death that was due to eight coils of the umbilical cord around the neck.

REFERENCES.

[1] Holzapfel, Karl: Tod der Kinder durch Nabelschnurknoten. Zeitsch. für Geb. und Gyn., 1913, lxxiv, p. 186.

[2] Gottschalk: Steisslage infolge Umschlingung der kindlichen Kehle mit placentarem Endtheil einer 92 cm. langen Nabelschnur. *Ibid.*, liv, 1905, p. 162.

[3] Strassman: Demonstration in den Verhandlungen der Gesellschaft für Geb. u. Gyn., zu Berlin. *Ibid.*, xlv, 1901, p. 573.

[4] Hamill, R. H.: Dystocia Occasioned by the Umbilical Cord Encircling the Arm Twice and Neck Four Times. Univ. M. Mag., Phila., 1889-90, ii, 29.

[5] Maener, A.: Ueber die Häufigkeit der Nabelschnurumschlingungen. 1901.

[6] Beach, R. M.: Fetal Death Due to Eight Coils of Umbilical Cord about the Neck. Am. Jour. Obst., N. Y., 1916, lxxiv, p. 298.

THORACOPAGUS: AN UNUSUAL CAUSE OF DYSTOCIA. REPORT OF A CASE.

By Samuel Cline, M.D., Boston.

[From the service of Dr. Halsey De Wolf, Visiting Physician, Providence Lying-in Hospital.]

No apology is necessary for bringing to the attention of the profession details of an unusual fetal dystocia which, from its rarity, if for no other reason, is of especial interest.

Double monsters, for purposes of classification, are divided into three groups (Williams): (1) Dipagus, (2) Ischio-craniopagus, and (3) Thoracopagus.

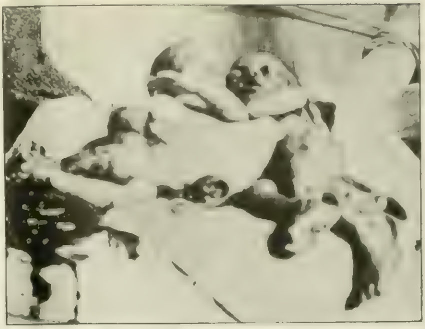
While Williams speaks of the great difficulty of delivering all of these cases, he claims a comparative degree of ease in effecting the delivery of the third group, due to some degree of advantageous give "of the portion connecting the twins."

This case is of particular interest because of the close similarity between the actual mode of delivery and appearance of the children as compared with the academic description of such cases. We can find, in the literature, only four cases of this type of fetal dystocia, during the year 1916.

Mrs. L., 31 years old. Italian. Family history negative. Obstetrical history, five children, born normally. Past history, negative. Present condition: on April 1 was brought into the hospital, after 12 hours of labor. On entrance, pulse 96, temperature 98, respiration 26. Patient was in good condition and having good contractions. Attempts at delivery by a physician outside had resulted in the birth of the head and one shoulder of a good-sized child, which was dead.

Vaginal examination by Dr. DeWolf, soon after entrance, showed what appeared to be a hard mass connected with the child's sternum and tightly wedged under the pubic arch, preventing all further progress. This mass felt as if it might be an outgrowth of the sternum, possibly an osteoma. It was noticed that the child had a hare lip. Abdominal examination showed a uterus in tetanic spasm, the contractions, or rather contraction, being very severe. The only fetal part which could be felt was a large, hard, round mass in the right lower quadrant, which was believed to be either a second head, or possibly some abnormal growth (as an osteoma of the sacrum) of a single monster. No extremities could be felt.

As it was evident that it was impossible to deliver the infant by traction, and intra-vaginal manipulation being impossible on account of the size of the child's body, it was decided to amputate the infant below the scapulae. This done, a hand inserted into the uterus easily delivered the legs and pelvis of the child by version, when it became evident that the infant's body was connected with a second one within the uterus. It was now possible to do a version on the second fetus, though the extraction of the posterior shoulder and head were both difficult.



It was now seen that the supposed osteoma from the chest wall of the first child was the band connecting the two, which extended from the upper part of the sternum to the umbilicus, there being but one cord and placenta. The children thus were facing each other, connected by a skin and cartilaginous band.

Both fetuses were perfectly formed (except as noted below) and of the female sex. Their total weight was 11 lbs., 12 oz. They were connected along the entire length of the thorax, with about three cm. of tissue, in the band which joined them, the exact nature of which was not determined, as the specimen was preserved intact. The nourishment had been derived from one placenta, through one cord. As stated before, one fetus had a hare lip. Just below the umbilicus there was a failure to close the skin of the abdominal wall of each fetus, resulting in an extrusion of the intestine. The patient had an uneventful recovery, and was discharged two weeks after entrance.

BIBLIOGRAPHY.

Williams: Ischiopagus, Am. Jour. Gyn. and Obst., 1916
Pirrung: Dicephalus, Lancet-Clinic, 1916.
Herrgolt: Delivery of Double-Headed Child, Ann. de gynec. et d'obst., 1916.

Book Review.

Applied Immunology. By B. A. Thomas, A.M., M.D., and R. H. Ivy, M.D., D.D.S. Second edition revised. Philadelphia and London: J. B. Lippincott Co. 1916.

The first edition of this monograph from the William Pepper Laboratory of Clinical Medicine, was reviewed in the issue of the Journal for October 28, 1915 (Vol. clxxiii, p. 673). The early publication of this second edition is evidence that the book has met a professional demand for a practical, concise presentation of the more important phases of immunology and prophylactic, diagnostic and therapeutic applications of sera and bacterins. A number of additions have been made to the text of this new edition and some new matter is interpolated. The illustrations and appendices remain as before.

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THOROUGHNESS IN RAPID PHYSICAL EXAMINATIONS.

The exigencies of war, especially when they are sudden and urgent, require the rapid physical examination of a vast number of men in the shortest possible time. These examinations must necessarily be conducted mainly by physicians whose training and experience fits them only for the slower, more deliberate methods of examination required in civil life. The question that naturally arises is whether such physicians can arrive at judgments sufficiently rapid to keep pace with the military need, or if they keep pace with such needs will they make proper judgments of fitness or unfitness in the very short time at their disposal? Military medical officers hold that thorough physical examinations can be made in about fifteen minutes and less. Of course this does not include the special laboratory, sensory and other examinations that might be needed to make definite determinations in doubtful instances. The fact is that in so far as the military requirements are concerned, an individual is either plainly fit or plainly unfit. Whether the military needs are so large or so urgent that no fit person must be allowed to go because of a doubt, or because a certain degree of deficiency must be accepted, special provisions must be made for the reëxamination of these, but the time consumed in these special examinations cannot be added to the general average time required in the examination of each individual. Similarly, in keeping with modern thought on the subject, defectives must not be arbitrarily discharged as unfit for any military duty, but specially examined to see whether there is not some special military duty they are fitted for. But in either instance, in doubt or in partial defect, the special examination is for individuals who have been primarily determined unfit.

If the ability and the powers of observation of the ordinary physician are acute enough, he can be relied upon to make competent examinations thoroughly. For military purposes, it is not expected that the examiner make refined differential diagnoses, nor must he fawn over or idle about a defect that is apparent upon first observation, nor speculate upon a condition of unusual interest or rarity. The examiner must only determine that there is a disqualifying pathological condition, and no more. This can be done in a very short time. And while it is true that there are clinical indications of doubtful significance, the number are too few to influence the net conditions of the examinations.

There is no doubt that medical examiners will pass into service the diseased and the unfit, and refuse the fit, but that would be expected to be the result of the personal equation of any class of men. Indeed, it has been said that the great number of the tubercular in the French military units was due to rapid and unthorough physical examinations. Positive cases can be detected, even with rapid examinations. Doubtful cases are hard to diagnose, even with significant symptoms and with the aid of laboratory or other appropriate guides. Rapid examinations do not mean snapshot diagnoses, but merely the passing of rapid judgments upon facts actually presented to the examiner. Doubt is often unjustly engendered by lingering too long upon a state of fact that would otherwise be rapidly and accurately disposed of.

As experience is gained in this sort of examination, the examiner will be quicker to discover conditions which even the better but slower and more deliberate clinician would fail to discover. For it must be remembered that as every phase of military medicine is different from civil medicine, this form requires special experience before aptitude is acquired. There need be no fear that this sort of examination will draft into the army the diseased, to infect the others, or the unfit to hamper the fit. The fact is that many able individuals become disabled, and many physical defectives become effectives under the military regimen. With ordinary care one condition makes up for the other, to keep the average the same. To be effective in this work, the medical examiner must only learn to make a diagnosis when the facts are before him, must develop his powers of observation, must learn to be quick in making his decisions,—indecision is fatal everywhere,—must learn to pass the rare and interesting cases by just as quickly as the ordinary one, without fondling it, and must learn not to spend too much time between each examination. The whole matter of thorough examinations, combined with speed, resolves itself into the elimination of time waste and duplication. These two elements mastered, no amount of speed must be feared. What advantage is the lengthening out of the time of examination, if it is at the cost of repetitions of hearing, seeing and feeling? The medical examiner must be able to see when he sees, hear when he hears, and feel when he feels, without repeating every sensory impression to make sure that it is so.

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DANGERS OF RADICAL GYNECOLOGIC SURGERY.

It had long been understood that there was some relation between certain nervous phenomena and the sexual apparatus. Indeed, the term "hysteria" has its origin because of this relationship between uterus and these nervous manifestations. Yet, although this relationship was acknowledged, it was based entirely upon empiricism. Not until the present understanding of the function of the so-called glands of internal secretion and the secretion itself—the hormone—did the true significance of this relationship dawn upon the profession. The nervous manifestations following disturbance or removal of the sexual apparatus need not follow out the type in hysteria as it is classically understood. It may assume any form, is usually progressive and severe. There is little doubt now, at least in so far as the ovaries are concerned, that the sexual apparatus has a double function, the obvious generative and the internal secretory. The internal secretion of the ovary is a hormone that increases the oxidation of the tissues, influences metabolism, increases the hemoglobin content of the blood, influences the respiratory exchange, and in general controls the sexual function in coöperation with the other glands of internal secretion—the endocrinic system. In this way, while the menstrual function ceases at menopause, the influence of the secretion of the ovaries continues after menopause, and the removal of the ovaries makes for a more rapid and violent menopause, with no recovery from the psychic manifestations accompanying the menopause. Even now, however, the exact operation of the ovarian internal secretion is merely a matter of conjecture. There is sufficient evidence, nevertheless, that the nervous disorders following destruction or removal of the generative organs, especially the ovaries, are not merely fanciful or "hysterical," but really organic in the sense that the symptoms are the results of tissue or molecular changes in the nervous system caused by the lack of the special secretion evolved by the ovaries.

The removal of the uterus and adnexa, but especially of the ovaries, must not be undertaken except with this danger entirely in view. The loss of the generative function after radical operation is the least of the evils of surgical treatment. Operation on the generative apparatus must not be undertaken except on distinct and palpable organic changes which allow of no other treatment. This really simmers down to malignancy. Of course, the drainage of pus or other pathological fluids or correction of malpositions are not included in this question. Medical treatment of many of the conditions for which operation is so frequently advised has had good results. It must be generously tried out, if for no other reason than to postpone radical operation for as long a period as possible. And when operation is finally decided upon, it must be most conservative. The fact that there is some disease of the ovaries does not necessitate the removal of the whole of them. It is true that very often radical surgery gives the least shock, allows of speedier recovery and affords the best surgical technic, but these advantages must not militate in favor of radical operations in gynecological cases. The principle of gynecologic surgery should be the removal of the least amount of tissue consistent with pathological indications of the strictest construction and not with the best surgical technic. In so far as the continuance of menstruation and the absence of nervous symptoms are concerned, even the retention of the smallest amount of ovarian tissue will conserve function and prevent nervous disorder. Except in malignant disease, there are very few instances of ovarian disease where some healthy tissue cannot be isolated from the mass of unhealthy tissue.

Finally, much of the disease relating to the generative organs—mechanical, traumatic and a great deal psychic—is highly amenable to medical, mechanical or psycho-analytic treatment.

TETANUS PROPHYLAXIS.

Although the total number of cases of infection with the tetanus bacillus is not very large, perhaps principally because the wound incidence in civil life is spread out very thin among the communities, the disease is, nevertheless, more frequent than is commonly supposed. The form most commonly met is that of the new-born consequent on removal of the umbilical cord. But when a vast number of wounded are assembled, as in the present war, the tetanus problem becomes a very important one and one very hard to solve. The tetanus bacillus is spore-bearing, anaerobic and very virile. It is difficult to destroy, even with high temperatures, except when the fractional method of sterilization is employed. Antiseptics seem to be of little avail against this bacillus. The spore will retain its vitality for months and even years, in the dust of old walls or cellars, especially when protected from the sunlight. The fact that the bacillus may exist in the intestines of herbivorous animals, especially the horse, may have some relation to the frequency of tetanus among the soldiers wounded on the battlefield.

The successful treatment of tetanus is still very unsatisfactory, the mortality being almost absolute. However, the prophylactic treatment of all who are exposed to infection has given remarkable results. In this respect, the recognition of suspicious wounds is most important. It is best to consider every wound as suspicious that is inflicted in the habitat of the tetanus bacillus. This applies especially to wounds that are deep punctures or that are much contused and lacerated. Wounds involving such of the compact tissues as the aponeuroses and the tendons are particularly liable to infection, especially when the wounds are gangrenous. Mixed infection of a wound with pyogenic or even saprophytic bacteria aid the development of the tetanus bacillus because by the use of oxygen for themselves they make conditions in the wound even more anaerobic. The size of a wound, however, is of no import. Even very small abrasions may harbor infection. The contact of non-infected wounds with the infected wounds or dressings may cause infection; and even suspicious cases should be isolated to prevent contact.

Generous incisions of all suspicious wounds and the injection of tetanus antitoxin are the two means of preventing the development of tetanus. Where both measures cannot be carried out, the antitoxin treatment should be chosen because it is the most effective of the two measures. The limit of certain protection by prophylactic injections does not outlast a period of 48 hours, nor does the protective effect of the serum last longer than 10 or 12 days. If the wound is not healed, then a new protective injection must be made. Injections are best made into or around the principal nerve supplying the region of the wound. It should be made between the wound and the spinal cord, in order to block the flow of toxin along the nerves from wound to nervous system. But such radical procedures as laying the nerve bare for injection is not generally countenanced. The usual prophylactic dose of tetanus antitoxin is 1500 units. In Europe, where the question of economy is a very vital one, the dose is often as low as 20 units with satisfactory results. It has been suggested that the application to the wound of absorbent cotton, previously soaked in antitoxin and then dried, would be an efficacious means of prophylactic treatment when not feasible otherwise, the secretion from the wound liberating the antitoxin continually while in contact with the wound.

WAR MEDICINE.

Most of us are inclined to think of the work of the medical officer in war time as entirely surgical in nature, and to ignore entirely the purely medical needs of the field. It is true that no estimate can be formed as to the proportion of medical and surgical work in warfare, but neither can a sharp line be drawn between purely medical and purely surgical work. In any event, the military organizations have at least the same medical morbidities as the civilians, reduced only by the fact that the soldier is a picked person physically, whose resistance is expected to be greater than that of the civilian. On the other hand, this reduction is balanced by the unusual mode of living during actual warfare,—exposure, stress, etc.,—and creates work for the physician rather than for the surgeon. Moreover, if it is remembered that the laboratory workers, radiographers, neurologists, etc., although directly assisting the work of the surgeon, are not engaged in actual surgery, it can be seen that the work of the medical officer in war time embraces a varied field. Even in the actual surgical cases, the work of the physician comes in in the after-care, the convalescence and the like. The large number of actual mental and nervous disturbances, the direct results of action, still further increases the proportion of non-surgical cases. The physician who hesitates to join the military forces because he has neither the actual surgical experience nor the surgical temperament, is laboring under a delusion as to the needs of the military medical services. Surgical work fills in only a small intermediary part of the soldier's medical care in warfare. The examination of the soldier for service, the care of his health, the sanitary organizations, diagnosis, after-care and convalescence, are all in the hands of the physician. This arrangement is a fortunate one because it allows the surgeon and his surgical endeavors to assume a higher degree of specialization when relieved of the previous or subsequent responsibilities of the case. War surgery, and even war medicine, must be treated from a different angle than civil surgery or medicine. Both the physician and the surgeon must undergo special training before they can successfully cope with the new phases presented in military conditions. The large field for medicine presented in war times offers an opportunity for every medical man engaged, to develop the side of his abilities for which he is best fitted. It does not follow that one whose previous training was entirely medical will not develop the surgical side of his abilities in the field. The war will give many a man an opportunity to find himself, for there is, perhaps, no other field that has developed to such a high degree as medicine and which can utilize so much new material. The introduction of the psychiatrist into the field will give a large impetus to the study of the etiology of mental and nervous disorders, but particularly to their prevention and treatment.

While expert surgeons are needed in the field, the pride of modern war surgery has been that there is need of less operation--less amputations— and yet more saving of life and limb because of better diagnoses and greater care. But the born surgeon will soon find his place, no matter in what branch he starts or what his previous training. There need be no fear that there may be too many physicians and too few surgeons. The law of supply and demand will hold here as elsewhere. Even in civil life many excellent surgeons have been made from the general medical practitioner.

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MEDICAL RESERVE CORPS.

The new department of the Army Medical Corps created by the Surgeon-General, to be devoted to reconstruction and reëducation of crippled soldiers, calls for an added number of enlistments from the medical profession into the Medical Reserve Corps, to care for this branch of the service. Major Joseph Colt Bloodgood, of Baltimore, chairman of the committee on preparedness of the Southern Medical Association, has sent a letter to physicians who are engaged in first-aid work in industries, requesting that if their relation to the industries of this country have given them any experience in the problem of vocational reëducation and of finding new employment for the reëducated handicapped industrial worker, they communicate with him.

Major Edgar King, Medical Corps, U.S.A., has been placed in charge of the work. Whether he be medical or non-medical, whoever, by reason of his contact with this problem in industrial lines, has gained special experience, can be of assistance to the department at this time. He is urged to send his name and credentials to the Surgeon-General's office and offer his services.

Major Bloodgood urges the necessity of filling the ranks of the Medical Corps with trained men, and called attention to the need of men with special training in orthopedics, brain surgery, and plastic surgery of the face. To graduates in medicine, commissioned in the Medical Reserve Corps, he states that Major Brackett, in charge of the orthopedic group; Captain Bagley, in charge of the brain group; and Captain Blair, in charge of the oral and plastic surgery group, are anxious to get a number of young men who have had good hospital experience and some general surgical training, to take an intensive training in one of these specialties and to prepare them to go into one of these groups.

Those who are not commissioned in the Medical Reserve Corps fall in the following groups:

1. Physically unfit. There is no question as to this exemption, but the probabilities are that you are able to perform your duties in civic life, and you should try in some way to release an equally trained man who is physically fit. Perhaps you could substitute for one who is in a public health position, or one who is a teacher. It would be unusually helpful if you could form a partnership with a man of equal training, but physically fit, who is prevented from going for financial reasons, and divide your increased earnings with this man.

2. Teachers in medical schools. The Surgeon-General feels that it is imperative not to weaken the faculties of the medical schools, but members of the teaching staffs should do all in their power to release as many as possible among their number who are physically fit and have some special training, filling their places with men of equally good training who are not teaching, but who are physically unfit for service.

3. Public health officials. All agree that the state and city public health departments of this country should not be weakened. It is as important for the success of this great drive for democracy to protect the health of those at home as that of the soldiers. However, there are many opportunities for substitution here. Look for a man of equal training, but physically unfit, temporarily to take your place in the public health work. It might be possible in some cases for him to perform the duties of a public health official and to look after some general practice, or some specialty in medicine or surgery.

4. Many well trained and young graduates in medicine have been prevented from entering the Medical Reserve Corps because of dependents or financial obligations which cannot be met by the salary of even a Major in the Medical Reserve Corps. Apparently there is only one way for such men to be released for service in the army. They must find someone with about the same training, either aged over 55, or with some physical defect, and form some partnership with him so that the increased earnings of the one who remains at home will, to a large extent, protect the one who volunteers for the Medical Reserve Corps.

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ERADICATION OF RATS.

We are gratified to learn that a nation-wide campaign against rats is to be inaugurated by the Federal Government under the direction of the Bureau of Biological Survey, in connection with Mr. Hoover's work for food conservation, and that already the chairmen of the public safety committees of the separate states have been requested to organize local educational, publicity and extermination wars against this dangerous pest.

Through the work of the Women's Municipal League of Boston during its last winter's campaign, this section was well informed of the rat menace to both health and property, and it is much to be regretted that, in spite of the endorsement of all the commercial, civic and professional bodies, including the Suffolk District Medical Society, the rat-proofing law, that would have ultimately protected this city against an invasion of bubonic plague, was allowed to be tabled.

It has been editorially suggested by the local press that Mrs. Albert T. Leatherbee, who managed that campaign, should have the directorship of this State movement, and we believe that Mr. Endicott could make no better choice in giving her the appointment, which her experience and knowledge of the rat problem warrant. Certainly, to the medical profession of the State, with which she has been associated from birth, this appointment would be pleasing, and there is no doubt that Mrs. Leatherbee would prosecute the work with intelligence and vigor.

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PROPOSED HOSPITAL ON GALLOP'S ISLAND.—Plans to convert Gallop's Island into a hospital for convalescent wounded American soldiers returning from European battlefields are under advisement. Dr. R. Creel, Assistant Surgeon-General of the United States Public Health Service, visited the Island recently to inspect the existing buildings.

MEDICAL NOTES.

Request from the Surgeon-General.—The following request has been received from Major C. L. Furbush:

"The Surgeon-General directs me to invite your attention to the following:

He is arranging for special treatment for wounded, including special efforts for functional restoration of damaged parts and vocational reëducation for those who, from the nature of their illness or injury, are unable to follow their previous occupation.

It will be a very great help if he can know just what those who are suffering from chronic illnesses or who are partly disabled as a result of injuries, are now doing in the United States. As example, one having lost the right hand may still be a successful carpenter or a market gardener; one having lost both lower extremities may be sucessful in some line; one with chronic heart disease may have found a suitable occupation. The collection of this experience should be of remarkable assistance as showing what the various types can do. The information desired in reference to each case is as follows:

(*a*) Character of disability, medical or surgical.

(*b*) At what is the patient employed and how successful is he?

(*c*) In what way did he learn or enter his occupation after his injury or illness?

The names of the disabled are not necessary.

If any man who has been successful after an injury or illness desires to write a short autobiography stating his experiences, the same might be exceedingly useful in this work, in preparing a booklet to be distributed to the men at the proper time."

Poliomyelitis in Illinois.—On September 30 there were under observation in Chicago, Ill., 139 cases of poliomyelitis.

Tuberculosis Conferences.—The National Association for the Study and Prevention of Tuberculosis announces the programs of the six sectional conferences, to be held in October and November. These conferences are expected to be of vital importance to anti-tuberculosis workers and all others interested in the tuberculosis campaign by reason of the fact that the sessions will be devoted almost exclusively to war problems. The North Atlantic Tuberculosis Conference was held in Baltimore on October 17 and 18; the New England Conference, in Rutland, Vt., on October 4 and 5; Mississippi Valley Conference in Minneapolis and St. Paul, Minn., on October 8, 9 and 10; and the Northwestern Conference in Portland, Ore., October 15 and 16. The Southwestern Conference will be held in Grand Canyon of Arizona, October 22 and 23; and the Southern Conference in Chattanooga, Tenn., on November 9 and 10.

WAR NOTES.

Senior Military Medical Association.—William Duffield Robinson, chairman of the Senior Military Medical Association, has published a circular letter in explanation of the purposes of the organization of this society. He states as follows:

"Surgeon-General Gorgas called a representative committee of the older physicians to Washington for conference, and it was there arranged that an organization of the physicians past the age of fifty-five years (the age limit for admission to the Army and Navy Reserve Medical Corps) should be formed, and that it should also admit physicians under fifty-five years if they are kept at home by reason of teaching in medical schools or being unable to pass the severe medical examination required for admission to said Medical Corps.

The Senior Military Medical Association was then formed, and at a largely attended meeting the following officers were elected: president, W. W. Keen, M.D.; vice-presidents, James M. Anders, M.D., and John B. Deaver, M.D.; secretary-treasurer, C. B. Longnecker, M.D. A board of censors and an executive committee were also elected.

The purpose of the Association is to serve the government by performing such medical work as the members are capable of, especially at or near the member's residence. Its members mostly can do only part-time work, but some are able to go from home and do full-time service. The arrangement will probably be a contract with the government to do special service, with a military grading. The pay will be according to the grading and work performed.

It is felt that the members of the Association can act as consultants in general and special physical conditions of recruits and conscripted men; also, in matters of sanitation and hygiene, and in making general physical examinations and mental and special examinations and in working in local hospitals or established places or cantonments where the sick or injured men may be sent; or those where fitness may be brought about in men medically rejected from admission to the service; also in performing any other work they may be capable of by the direction of the government.

No assurance can at present be given as to when service may be requested. Men may apply for admission to the S. M. M. A. by filling out the blank card, which will be supplied upon request to Dr. Alexis Dupont Smith, Philadelphia, and returning it properly filled out and one dollar, the annual dues made necessary to cover postage and incidental expenses.

For the present, residential limit of eligibility for membership includes Pennsylvania, New Jersey, Delaware and Maryland. When points remote from Philadelphia have organized units or branches of the S. M. M. A., membership may be transferred."

Death from Typhus of Allied Prisoners.—An escaping French prisoner of a German camp is reported to have stated that 3700 French and British soldiers and 1500 Russian soldiers have died from typhus at the German concentration camp at Cassell, near Frankfort-on-the-Main.

Opening of Soldiers' Hospital.—The New England Deaconess Association has erected, beside its hospital on Pilgrim Road, Longwood, a portable hospital unit for the use of sick and wounded soldiers and sailors. It was formally opened on October 15 by Edwin H. Hughes, resident bishop of the Methodist Episcopal church. The hospital is equipped with thirty-five beds, including three private rooms for special cases, and is practically the same as those now in use as field hospitals in France. The cost of the unit furnished ready for service will be between $5000 and $6000. It has been named the "Willard T. Perrin Ward of the New England Deaconess Association for Sick and Injured Soldiers and Sailors." The committee which has had the construction in charge consists of William T. Rich, chairman, Dr. Daniel Fiske Jones, Clarence W. Williams, Willard T. Perrin, Miss A. A. Betts, Mrs. F. H. Eaves, Miss Ellen T. Emerson and Mrs. H. C. Gallagher.

War Relief Funds.—On Oct. 13 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$268,964.05
Armenian-Syrian Fund	236,305.25
Permanent Blind Fund	124,643.99
Surgical Dressings Fund	124,374.08
Serbian Fund	124,207.42
French Orphanage Fund	123,493.42
Polish Fund	87,844.86
Italian Fund	49,082.77
War Library Fund	41,560.45
Russian Refugees' Fund	38,734.14
La Fayette Fund	31,847.03
War Dogs' Fund	1,443.25

BOSTON AND MASSACHUSETTS.

Massachusetts State Conference of Charities.—The fourteenth session of the Massachusetts State Conference of Charities will be held in New Bedford, October 24, 25 and 26. The meeting will be opened on Wednesday evening by an address by Robert A. Woods, president of the conference, on "The State as the Great Community." Joseph Lee will speak on "Ethical Gains Through Legislation in the Last Twenty-five Years." On Thursday, October 25, the topic will be "The American Red Cross in War Time" and "State-Wide Services, Public and Private in Relation to the Needs and Resources of the State." On Friday, October 26, under the heading of "A New Epoch in Americanization," the representative of the immigrant department of the Young Men's Christian Association and the secretary of the new State Immigration Department will speak.

Appointments to Boston Health Department.—Mayor Curley has appointed Dr. Philip Castleman to the position of deputy health commissioner in charge of the division of laboratories. Dr. Castleman has been acting deputy health commissioner since the resignation of Dr. Slack in June. Dr. Van de Velde, a Belgian, has received the appointment of bacteriologist. He was born in Belgium in 1868, and received his degree of M.D. from the University of Louvain in 1894. He then took special courses at the Pasteur Institute, Paris, and the Institute of Hygiene, Rome.

In 1896, in a competition in pathological sciences among the four universities of Belgium, he was classed first. From 1894 to 1899 he was first assistant to Prof. Senyo in the Institute de Bacteriologie de Louvaine; in 1900 director of the bacteriological laboratory of the province of Antwerp; delegate in 1905 to the international congress of hygiene, Paris; in 1907, delegate of the government to the international congress of hygiene at Bordeaux; in 1910, medical member of the Belgian mission sent abroad to study campaigns against plague and rats; and honored by King Albert with the first-class civic cross for services during the cholera epidemic; and in 1914-1915 ship surgeon on the steamship *Java* of the Japan line.

Dr. Van de Velde arrived in San Francisco June 7, 1915, and on July 15 passed, in Boston, the State Board of Medicine examination with an average of 80.2.

Boston Board of Health.—During the week ending October 6, 1917, the number of deaths reported was 185, against 209 last year, with a rate of 12.49, against 14.33 last year. There were 27 deaths under one year of age, against 34 last year.

The number of cases of principal reportable diseases were: diphtheria, 72; scarlet fever, 16; measles, 23; whooping cough, 16; typhoid fever, 10; tuberculosis, 48.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 6; typhoid fever, 1; tuberculosis, 2.

Total deaths from these diseases were: diphtheria, 1; tuberculosis, 20.

Included in the above were the following non-residents: tuberculosis, 1.

Reduction of Infant Mortality in Boston.—The August Bulletin of the Health Department of Boston contains the following note regarding the reduction of infant mortality in this city:

"For the thirty-one weeks of this year, ending September 1, there has been an appreciable decrease in the number of deaths in infants under one year, as compared with the same period last year. This is a commendable and gratifying result obtained by much effort on the part of the various organizations, associations and parents working for this common end. The efforts that have been made are justifiable in view of the fact that there has been a decrease of 7% in the number of deaths over last year. Education, milk stations, together with constant and regular visits by nurses to the homes before and after childbirth, have accomplished much in this work. The figures this year show a sufficient reduction to warrant a decreased infant rate over the figure of 1916. The month just passed showed a reduction of more than 30% over last August, and surely this is most encouraging in view of the fact that the past summer has been very hot and extremely trying to infants.

Inspection of Fish.—Boston ranks as one of the largest fish markets in the world, 100,000,000 pounds of fish being annually brought in by boats and 50,000,000 by other vehicles. That this amount of fish requires constant supervision and inspection is brought out by the fact that during August there were condemned at one receiving depot 8000 pounds of salt herring, 600 pounds of salt mackerel, 18,100 cod, 200 pounds alewives, and 2800 pounds salt cod. The cod and mackerel were not sufficiently salted to preserve them, owing to a scarcity of salt in some of the fish-packing towns, and they became decomposed during the hot weather of August.

Bequest to School and Hospital.—By the will of the late Norman H. George the Harvard Dental School and the Boston Floating Hospital are each recipients of a gift of $10,000. The Newton Hospital receives a part of the residue of the estate.

The Massachusetts Medical Society.

STATED MEETING OF THE COUNCIL.

A stated meeting of the Council was held in John Ware Hall, Boston Medical Library, Wednesday, October 3, 1917, at 12 o'clock, noon. The president, Dr. Samuel B. Woodward, was in the chair, and the following 84 councilors present:

Barnstable,
C. W. Milliken.

Berkshire,
Henry Colt.

Bristol North,
W. O. Hewitt.
F. A. Hubbard.

Bristol South,
E. F. Curry.
W. A. Dolan.

Essex North,
T. R. Healy.
R. V. Baketel.
G. E. Kurth.
E. H. Noyes.
J. J. O'Sullivan.

Essex South,
C. H. Bangs.
R. E. Bicknell.
W. T. Hopkins.
J. B. Macdonald.
W. G. Phippen.
Emile Poirier.
R. E. Stone.

Franklin,
G. P. Twitchell.

Hampden,
T. S. Bacon.
R. A. Greene.

Middlesex East,
E. S. Jack.

Middlesex North,
W. B. Jackson.
J. H. Lambert.
E. G. Livingston.
M. A. Tighe.

Middlesex South,
G. T. Tuttle.
H. T. Baldwin.
F. E. Bateman.
E. H. Bigelow.
C. H. Cook.
John Duff.
Edward Mellus.
C. E. Mongan.
Godfrey Ryder.
L. F. Sise.
F. R. Stubbs.
Julia Tolman.
G. W. Whiting.
Alfred Worcester.

Norfolk,
E. H. Brigham.
A. N. Broughton.
C. B. Faunce.
R. W. Hastings.
G. W. Kaan.
Bradford Kent.
W. C. Kite.
Joseph Kittredge.
W. A. Lane.
S. H. Rubin.
Victor Safford.
H. F. R. Watts.

Norfolk South,
C. S. Adams.
G. H. Ryder.

Plymouth.
N. K. Noyes.
A. A. MacKeen.

Suffolk,
H. F. Vickery.
E. S. Boland.
W. L. Burrage.
E. A. Codman.
J. A. Cogan.
E. G. Cutler.
R. L. De Normandie
Albert Ehrenfried.
C. M. Green.
J. B. Hawes, 2d.
W. C. Howe.
H. T. Hutchins.
J. L. Morse.
G. G. Sears.
G. C. Smith.
G. G. Smith.
Mary A. Smith.
A. K. Stone.

Worcester,
M. F. Fallon.
F. H. Baker.
W. P. Bowers.
David Harrower
A. G. Hurd.
W. L. Johnson.
F. H. Washburn.
C. D. Wheeler.
S. B. Woodward.

Worcester North,
A. P. Mason.

It was voted to dispense with the reading of the records of the last meeting.

Two reports of the Committee on Membership and Finance were presented by Dr. C. M. Green, Chairman, and each was accepted and its recommendations adopted unanimously.

Report on Membership.

The Committee on Membership and Finance makes the following recommendation as to membership:

That the following named Fellows be deprived of the privileges of fellowship, under the provisions of Chapter I, Section 8, of the by-laws:

Brown, Melvin James, of Mars Hill, Maine.
Sullivan, James Francis, of Lowell.

For the Committee on Membership and Finance.

Charles M. Green, *Chairman.*

Report on Finance.

The Committee on Membership and Finance makes the following recommendations as to finance:

1. That the affiliation with the Boston Medical and Surgical Journal be continued during the year 1918, at an expense to the Society of three dollars ($3.00) for each member in good standing.

2. That the sum of one hundred dollars ($100.00) be appropriated to meet the expense of clerical assistance to the Secretary during the months of October, November and December of the current year

For the Committee on Membership and Finance.

Charles M. Green, *Chairman.*

Dr. E. H. Bigelow, Chairman of the Committee on Public Health, made a few remarks, calling attention to the success of the recent Convo cation and School of Instruction for Massachusetts Health Officials, Boston, September 4-7, 1917, through the activity of the agent of the committee, Edward A. Ingham. He said that this society had stood back of the committee in a splendid way, and the committee was very much pleased with the attendance and with the result of those meetings.

The petitions for reinstatement of the following were acted on favorably by the Council: E. E. Doble, Lena V. Ingraham, A. C. Leach, J. F. R. Biron, J. C. Stammers, and W. J. Johnstone. The petition of W. J. Brickley for reinstatement was referred to the following committee: Gerald Blake, F. H. Lahey, and F. S. Kellogg.

The president nominated and the Council appointed the following as delegates to the annual meeting of The Vermont State Medical Society, at Barre, Vt., Oct. 11 and 12, 1917: J. E. Urquhart, Ashfield; and A. T. Marshall, Chelsea, Vt.

The president nominated and the Council appointed the following as delegates of the Society to the Conferences on Medical Education, Health and Public Instruction, and Medical Legislation, respectively, under the auspices of the American Medical Association, at Chicago, Ill., in February, 1918: H. C. Ernst, Boston; E. H. Bigelow, Framingham; and S. B. Woodward, Worcester.

The privileges of the floor were voted to Dr. Albert Evans, who introduced the following preambles, with explanations:

> *Whereas*, In the address of Mr. Edwin Mulready, Commissioner of Labor, to the Massachusetts Medical Society, on the occasion of its last Annual Meeting, there was a tone of appeal to the Massachusetts Medical Society for assistance in the right solution of pressing problems confronting the State Board of Labor and Industries; and
>
> *Whereas*, Great changes are taking place at present in industry for the reason that so many men have entered the Army that women and children are being crowded in to take their places; and
>
> *Whereas*, While the effect of this movement on the population will be watched carefully by those who have an eye to the welfare of our people, medical investigation becomes more and more necessary to interpret the results; and
>
> *Whereas*, Large plants are being erected for the manufacture of poisonous gases, and those who work in these establishments are subject to great hazards, many of which are imperfectly understood by the workers, and several of these hazards are at present waiting investigation;

And on motion by Dr. F. H. Washburn, the following resolution was passed unanimously:

> *Resolved*, That a committee of five, one member of which shall be a Councilor, be appointed by the Chair to work in coöperation with the State Board of Labor and Industries.

The Chair appointed the following committee: Albert Evans, Harry Linenthal, Arthur A. Howard, John T. Williams, and Frank G. Wheatley.

Dr. J. B. Blake made the following report as to the attendance of the Massachusetts delegation at the House of Delegates of the American Medical Association last June, that was accepted and placed on file:

> The entire Massachusetts delegation was present at the 1917 meeting of the House of Delegates; all answered the first roll-call. This was the first meeting in which the House of Delegates was in charge of its own chairman, elected last year to this office; in previous years the president of the American Medical Association has acted also as chairman of the Delegates; the new arrangement worked admirably and will be continued.
>
> A large amount of business was disposed of, including many resolutions offering assistance in various forms to the Government. The resignation of Dr. W. T. Councilman as trustee, was received with much regret. Dr. Wendell C. Phillips of New York was elected in his place. After Dr. Arthur Dean Bevan of Chicago was elected president for next year, practically by acclamation, Dr. E. H. Bradford of Boston was nominated for 1st Vice-President (by Dr. John Bapst Blake), and was immediately elected without any competitor. Dr. Walter B. Cannon was reappointed (by Dr. Mayo) to the Committee on Health and Public Instruction. Chicago was chosen as the place for the next annual meeting. The House of Delegates adjourned on Thursday, June 7th, after having accomplished a large amount of business, having listened to many extremely interesting reports, all of which will be found in the columns of the *Journal of the American Medical Association*.
>
> John Bapst Blake.

A letter from Dr. E. H. Bradford, Chairman of the Committee to look into the matter of an academic chair of Military Medicine in the Commonwealth, was read by the Secretary. Dr. Bradford reported that thus far he had received a contribution of $300 toward the founding of such a chair.

The president read a letter from the Boston agent of the Liberty Loan Committee, calling attention to the fact that the new loan was ready for subscription.

Upon nomination by the President, Dr. S. J. Mixter of Boston was elected a councilor for Suffolk in place of John Warren, resigned.

Dr. A. K. Stone, Chairman, reported for the Committee on Health Insurance. He said that several meetings had been held and that members of the committee had attended the hearings of the special commission at the State House, and that a stenographer had reported them. The reports have appeared in the Journal for the benefit of the members; they give everybody some idea of what is taking place in the minds of the commission, and also some idea of what is being presented to them. If anyone has any ideas upon social insurance, if he will kindly transmit them to the chairman, he will see that they are presented to the commission. There may be a chance at this time for some constructive work to be done, so that a bill may be introduced that shall in no way harm the medical profession. He suggested that the Council would be glad to hear from Dr. W. A. Dolan of Fall River, who had attended the first meeting of the commission in the State outside the State House, held in his own city Oct. 2. Dr. Dolan thought that the difference between this meeting and the one held a year ago was very pronounced. A year ago the interest centered on old-age pensions, with a very slight mention of health insurance, whereas the meeting this year introduced health insurance as the main topic of the evening, and everybody was interested in it. There was a large attendance of mill-owners and mill operators. The leaders of labor, very bright men, were there, and all had their say. The manufacturers were represented by Mr. Robert Bond, a very keen lawyer, and a man interested in medical work and in legislation on medicine and sanitation. It was made very plain that the labor man demands health insurance, but non-contributory.

Dr. W. L. Johnson of Uxbridge complimented the labor leaders in Fall River for seeing something which the leaders in the State House do not see. He emphasized the fact that the medical profession ought to be represented on the committees, as at present there is a dearth of doctors on them. He said, if we are well represented, we shall find the medical profession stands stronger than ever before.

Dr. A. N. Broughton, Chairman of the new Committee on Workmen's Compensation, said that he had no report to make; that the main work for the coming months will be to acquaint the profession and the labor interests themselves that they have a new law.

Dr. C. E. Mongan said that there is no doubt in the minds of those who have attended the health insurance hearings that the profession of medicine is facing a crisis as far as the practice of medicine is concerned; for the practice of medicine is no longer a private matter, but a public profession. The public are deeply interested in their own health, and manufacturers are insisting on caring for the health of their employees. He called the attention of the Council to the following articles on this subject: "Adequate Medical Service of the Future," Otto P. Geier, M.D., Cincinnati; and "The Framingham Health and Tuberculosis Demonstration," D. B. Armstrong, M.D., Framingham, Mass. Both of the articles are to be found in the *Journal of the American Medical Association*, September 29, 1917, Vol. lxix, No. 13, pp. 1041, 1051.

Dr. Broughton had suggested that the Commission write to the presidents and secretaries of the district societies when a hearing is to be held in a given district, and he understood that it had done so, and he hoped that the district officers will insure a good attendance at the hearings. He inquired if the Committee on Health Insurance had expressed an opinion as to whether any health insurance legislation is desirable.

Dr. Stone said that the committee has expressed no opinion, but has discussed only the general proposition.

Dr. Broughton said that it seemed to him that the matter of the utmost importance at the present time, where every district of doctors is tied up with war problems, either directly or indirectly, was to put over the whole affair, and that we should use our influence to postpone any possibility of immediate action. He thought that there is a large number of men who know nothing about the commission, and he felt that the commission is anxious to get the opinion of the individual doctors throughout the State in an informal way.

Dr. E. S. Jack said that, at a recent meeting of the Middlesex East District Medical Society a series of papers on health insurance was read. A vote was passed that on account of the social unrest,—which does not promise to be any less after the war is over,—together with the vastness of the subject, it was considered undesirable to have any legislation on health insurance passed at present. He then referred to the good results which had been brought about in Melrose by the agitation of the subject of public health, and by the establishment of a guild in connection with the hospital, all of which had tended to a better condition of the people, and an increased interest in health problems by the public.

The president made a few remarks, stating that he had attended many hearings and meetings, and had favored postponing legislation on health insurance.

Adjourned at 12.55 noon.

Walter L. Burrage,
Secretary.

Obituary.

MOSES G. PARKER, M.D.

Moses G. Parker, M.D., a veteran of the Civil War, died at his home in Lowell, Mass., on October 1. Dr. Parker was born in Dracut in 1842, graduated from Phillips Andover Academy, and in 1864 received his degree from Harvard Medical School. He then enlisted with the 57th Massachusetts Infantry and received a commission as assistant surgeon. After the war, he spent two years in study abroad and established himself in practice in Lowell, Mass. Dr. Parker was closely identified with the development of the telephone, having been early an advocate of its usefulness. When the New England Telephone and Telegraph Company was organized he was made a director, and held that position until his death. He was also prominent in genealogical research and patriotic work, and was a member of the Society of Colonial Wars, the Society of Colonial Governors, and the Sons of the American Revolution. Of the latter society he was at one time vice-president-general and he was also past president of the Massachusetts S. A. R. Dr. Parker was well known in his profession as an eye and ear specialist. He was a Fellow of the Massachusetts Medical Society and local medical societies. He never married.

Miscellany.

DEPARTMENT FOR MILITARY ORTHOPEDICS.

The Surgeon-General made the following announcement today of the organization of a new Department for Military Orthopedics:

The very large percentage of the casualties of the present war which require special orthopedic method in their treatment (from 30-40%) and the large percentage of these cases when so treated that can be restored to military usefulness (from 70-75%) has led the Surgeon-General to create an organization to care for these cases. This will be designated "The Department for Military Orthopedics," and will have to do with the work that is required both at home and abroad.

Major Elliott G. Brackett, M.R.C., has been appointed Director of Military Orthopedics, with headquarters at the Surgeon-General's office.

Major David Silver, M.R.C., has been appointed Assistant Director of Military Orthopedics, with the same headquarters as the Director.

For the Expeditionary Forces, while the work will be under the authority of the Director, nevertheless, so much special organization will be required that the office of "Director of Military Orthopedics for the Expeditionary Forces" has been created, and Major Joel E. Goldthwait, M.R.C., has been appointed to fill that position.

Associated with him and to serve as Assistant Directors, Major Robert B. Osgood, now serving with U. S. Base Hospital No. 5, and Capt. Nathaniel Allison, now serving with U. S. Base Hospital No. 21, will be transferred from their present positions to this department. Major Osgood will be temporarily assigned to Col. Robert Jones, the Director of Military Orthopedics for the British Forces, for the study of details of organization and methods of treatment, and Capt. Allison will be temporarily assigned to similar study with the French and Italian forces.

For the assistance of the Directors, an Advisory Orthopedic Board has been created and is made up as follows: Dr. Robert W. Lovett, Boston, Mass.; Dr. Albert H. Freiberg, Cincinnati, Ohio; Dr. G. Gwilym Davis, Philadelphia, Pa.; Dr. F. H. Albee, New York, N. Y.; Dr. John L. Porter, Chicago, Ill.

The classification adopted, of the conditions to be considered orthopedic, is practically the same as that in use by the British Government, and is as follows:

(*a*) Derangements and disabilities of joints, including ankylosis.

(*b*) Deformities and disabilities of the feet, such as hallux valgus, hallux rigidus, hammer toes, metatarsalgia, painful heels, flat- or claw-feet.

(*c*) Malunited or ununited fractures.

(*d*) Injuries to ligaments, muscles, and tendons.

(*e*) Cases requiring tendon transplantations or other treatment for irreparable destruction of nerves.

(*f*) Nerve injuries complicated with fractures or stiffness of joints.

(*g*) Cases requiring surgical appliances, including artificial limbs.

Since prescribed and regulated work is one of the most valuable therapeutic agencies that is in use in the great orthopedic hospitals abroad, the development of the so-called Curative Work Shop is a natural part of the general orthopedic equipment, and since the reëducation and training for industry is a natural development of this, a special advisory committee, to be called the Active Vocational Board, has been appointed and is as follows: Dr. Royal Meeker, Labor; Dr. David Edsall, Medico-Vocational; Mr. John E. Wilder, Industrial and Employment; Mr. Charles E. Stone, Industrial and Employment; Dr. Dean Lewis, General Surgery.

All affairs relating to military orthopedic surgery will pass through this department, and when bearing the signature of any of the three Directors may be regarded as official and representing the policy of this department.

E. G. Brackett,
Major, M.R.C., U.S.A.

SALVARSAN SWINDLE UNCOVERED.

The Department of Health of New York City has succeeded in unearthing a swindler who manufactured and marketed imitation neosalvarsan. The investigation, which began in June, came to a climax when Nicholas Clements was indicted. The prisoner was charged with grand larceny, forgery and conspiracy. According to Commissioner Emerson, a suspicious looking lot of neosalvarsan was encountered by Inspector Cohen of the Health Department's Bureau of Food and Drugs, of which Mr. Lucius P. Brown is director. The Inspector investigated, and on June 20 succeeded in obtaining ten tubes of what purported to be neosalvarsan, but which in reality was nothing but a little common salt, to which some yellow coloring matter had been added. Through persistent search, a second lot of the product was obtained some time later from a Third Avenue druggist. This lot was evidently indentical with the first.

During the recent session of the American Medical Association held in New York City, the Department of Health displayed samples of imitation neosalvarsan which had been discovered by its inspectors. As in the other cases just mentioned, the lot there exhibited consisted merely of common salt with yellow coloring matter. How extensive this fraudulent traffic has been may be gauged from the fact that the maker of this product had ordered 50,000 aluminum containers, made in imitation of those in which the genuine article is supplied.

According to Mr. Hugh W. Taylor, chief of the Health Department, Division of Drug Inspection, the traffic in this neosalvarsan was facilitated by the European War. Because of the difficulty in obtaining their regular supplies of neosalvarsan, physicians have readily been induced to purchase this drug from speculators at an advanced price. This has rendered the substitution of a false product, put up in imitation of the original, a very simple matter. Mr. Taylor displayed a number of tubes of this product seized by his men, and it was almost impossible to distinguish the imitation from the genuine. The printing on the label and circular has evidently been reproduced photographically, for it appears to be identical with the original. The embossed cap on the aluminum container is also cleverly imitated. There is a slight difference in the appearance of the product, but even this difference is not sufficient to warn any but an expert or a physician who is constantly using this product.

The traffic in the product must have been very lucrative. The small tubes cannot have cost more than five or ten cents each to prepare, and they were sold to physicians for from $5.50 to $9.00 each, depending upon the urgency shown by the physician. The original product sells for $4.50.

Through persistent detective work, Inspector Cohen finally traced the supply to an individual styling himself as "Doctor" Nicholas Clements of 2323 Belmont Avenue, The Bronx, and he accordingly arrested Clements on the charge of violating Section 116 of the Sanitary Code. On Wednesday of last week, the police finally captured the manufacturer of the lot of false neosalvarsan exhibited by the Department of Health at the meeting of the American Medical Association. This individual, Arthur Thommasses, was charged with grand larceny and held in $5000 bail.

When Clements was arrested, the interesting discovery was made that, not only was he manufacturing neosalvarsan, but that he was also engaged in selling false medical and dental diplomas.

The clues discovered were at once vigorously followed up. In this part of the investigation, Commissioner Augustus Downing, of the State Department of Education, rendered valuable assistance. His Department had suspected Clements for some time, but had been unsuccessful in securing sufficient facts to warrant his arrest. The first of the unlicensed "doctors" to be apprehended was a Dr. Lazinsky of East Ninth Street, Manhattan. According to Lazinsky, Clements sold him a diploma which upon examination proved to be false, and assured him that he would have no trouble in practising without a license because he, Clements was an inspector of the New York State Medical Association. This apparently was true, for among Clements' papers seized by the police, is a framed letter dated October 31, 1902, and signed "James Taylor Lewis," as Counsel for the New York State Medical Association, appointing him to this position.

"The results of this investigation," said Health Commissioner Emerson, "are of the greatest importance, for the work of these unscrupulous crooks threatened the life of thousands of people. It will be weeks before we can gain any idea of the extent of these frauds. In the case of Thomasses, one of the manufacturers of imitation neosalvarsan, the traffic apparently ran into thousands of dollars. One lot alone, now in the possession of the Department of Health, was valued at $1800, though, of course, it is not worth a cent. We have repeatedly warned physicians to beware of these false products, and in June we exhibited a lot of Thomasses' output at the meeting of the American Medical Association. Apparently as the result of our publicity, most of the recent sales were made to wholesale drug houses who wanted the drug for export. How much was thus sold outside of this city we shall never know. I have sent warning concerning this false product to health officials throughout the country and have asked the United States Public Health Service also to transmit this warning to the consular service."

CHILD LABOR LAW UNCONSTITUTIONAL.

It seems almost incredible that in this age, in a country whose people pride thmselves on their interest in humanity, it would be possible to declare unconstitutional a law prohibiting child labor.

This law was scheduled to go into effect on September 1. Under its terms no child under 14 years of age may work in any factory, mill, workshop or cannery, whose products are subject to regulation by Congress under the interstate commerce clause of the Constitution.

The law also prohibits the employment of children under 15 longer than eight hours a day, and they may not be employed between seven o'clock at night and six o'clock in the morning. Children must be more than 16 years to work in mines or quarries.

According to press dispatches, Federal Judge James E. Boyd, sitting at Greensboro, N. C., decided that the law was unconstitutional on the ground that Congress had exceeded its powers under the interstate commerce clause of the Constitution, and that under the fifth amendment a parent has the right to the services of his child, and the child has a right to work for his support.

We are not familiar enough with the legal interpretations of the interstate commerce section of the Constitution to judge whether the law as passed exceeded the powers granted to Congress. We cannot help marvel, however, at the operations of a legal mind which can find that a child labor law either deprives a person of "life, liberty or property without due process of law," or takes "private property for public use without just compensation," for these are the provisions of the fifth amendment to the Constitution.

LEGAL ADVICE FOR HEALTH OFFICIALS.

At a recent meeting of Massachusetts Boards of Health, Mr. James J. Ronan, a lawyer of Salem, Mass., made an address on the legal aspect of nuisances. In the course of his remarks he showed that the local board of health is almost supreme and is vested with higher authority than other city boards and committees. He stated that, in the first place, a city or town is not liable for the acts of a public officer and consequently not amenable for any conduct on the part of a member of the board of health which might have entailed some loss to a citizen and, in the next place, the members themselves are not responsible to an individual for failure to perform their duty, and are not liable, as are other public officials, for acts of negligence. In the matter of correcting public nuisances, he emphasized the importance of selecting the right statute under which to proceed when property rights are involved. To act under the General Nuisance Law, which makes no provision for trial by jury, is oftentimes to lose a case in litigation, but to act under the offensive trade statute or some other special law, is to assure trial by jury. He stated:

"This is well illustrated by the statutes governing offensive trades. Undoubtedly, because of the large amount of capital frequently invested in manufacturing plants and their industrial advantages to a community, it has been deemed desirable that the board of health should not have the final say in such matters, and consequently in the determination of whether any trade or employment is a nuisance or hurtful to the inhabitants or dangerous to the public, or is attended by injurious or offensive odors, while the board may prohibit the nuisance within the limits of the city or town or any place other than is assigned by the board, yet the property owner has the right to appeal from such orders of prohibition, and have a trial by jury in the superior court for the final determination of this question of fact While the matter is pending in court, the prohibited trade or employment cannot be carried on until there is judgment in favor of the property owner. In all such cases where the board is concerned with an employment or trade it will be necessary to proceed under the provision of the statute regulating offensive trades and not under the general statute."

SOCIETY NOTICES.

East Boston Medical Society.—Dr. Benjamin Tenney will address a meeting of the Society on "Urinary Calculi," on Thursday, October 23, 1917.

J. B. Taylor, M.D., *Secretary.*

Suffolk District Medical Society.—A stated meeting of the Society will be held on Wednesday, October 24, 1917, at the Boston Medical Library, 8 The Fenway, at 8.15 p.m.

Business: Election of Nominating and Auditing Committees.

Paper: "Repeated Caesarean Section," Dr. J. Whitridge Williams, Baltimore.

Discussion by Drs. Edward Reynolds, F. S. Newell, H. T. Swain and N. R. Mason.

Refreshments after the meeting.

Gilbert Smith, M.D., *Secretary.*

Censors' Examination.

The Censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at 8 The Fenway, on Thursday, Nov. 1, 1917, at 4 p.m.

Candidates, who must be residents of Suffolk District or non-residents of Massachusetts, should make personal application to the Secretary, and present their medical diplomas, at least three days before the examination.

For further particulars, apply from 2 to 4 p.m. to

George Gilbert Smith, *Secretary.*

99 Commonwealth Avenue.

RECENT DEATHS.

John Myrick Crocker, M.D., died at Cambridge, October 6, 1917, aged 72. He was born in Provincetown, May 22, 1845, was graduated from the Harvard Medical School in the class of 1866, joined the Massachusetts Medical Society in that year and settled in Cambridge. He was a member of the American Medical Association. He is survived by a widow and one daughter.

George Plummer Howe of Boston, Lieutenant, Medical Officers' Reserve Corps, was killed in action in France, September 28, 1917. The son of Dr. Octavius T. Howe, he was born in Lawrence in 1878. He was a graduate of Harvard College in the class of 1900, and of the Harvard Medical School in 1904, then serving as surgical house officer at the Boston City Hospital and joining the Massachusetts Medical Society in 1908. He settled in practice in Lawrence. He moved to Boston in 1915 and became assistant dermatologist to the Carney Hospital Dr Howe had made four trips to the Arctic as surgeon or scientist and had also been to Yucatan on a scientific expedition sent by Harvard University. He married Marion Dudley Endicott of Boston in 1911, and she survives him

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PAPERS AND DISCUSSIONS OF THE ANNUAL MEETING OF THE SOCIETY, JUNE 13, 1917.

The Bearings of Industry on Medical Practice.

By David L. Edsall, M.D., Boston.

Note.—Dr. Edsall had some statistics and spoke with these as a basis, summarizing the paper of Dr. Wade S. Wright on The Industrial Clinic of the Massachusetts General Hospital, Dr. Wright being absent and occupied with preparations for entering military service.

(Abstract.)

Before entering upon the practice of industrial medicine a physician must have special training in this work such as Dr. Wright has had, for to appreciate the needs of this special department previous instruction is necessary. The first thing to emphasize is to get into the habit of looking for the source of the hazard rather than to expect to get it from the history of the individual case. Since March, 1916, I have been studying this phase of the subject. At first there was difficulty in collecting statistics. A social service worker at the Massachusetts General Hospital was appointed to gather these statistics but this experiment failed because few cases reached her hands. Then physicians were asked for statistics, but few of them understood what the hazards were and little was accomplished. Finally, a social worker was stationed at the entrance to the out-patient department of the Hospital to ask for industry and trade processes, and during the last year she was able to interview 5100 cases of this sort as against about 600 in the previous six months under the former system. These figures showed that in 488 cases the occupation was the dominating factor. An intensive study of the lead poisoning cases was made. There were available for study 146 cases in the previous five years and 148 cases during the year after this study was begun. In every case the urine and feces were examined, and both showed the presence of lead. These cases showed a "lead hazard" and presented the following symptoms: colic 99; constipation 77, diarrhea 60, pain in extremities 30, pain about condyles, weakness of wrist, wrist drop in only five cases and lead line in 78 cases. The lead spots on the gums should always be looked for under a good light and with the corner of a piece of white paper under the gum. Among the cases of lead poisoning at the Massachusetts General Hospital was that of a boy who contracted it from cases of stockings which were labeled in gold paint. This paint contained from one-half to one per cent. of lead. There was a distinct lead hazard in 558 cases, most of whom were painters.

There are many cases of industrial diseases at the Massachusetts General Hospital and they should be studied from the technical point of view. The trade processes in which the patients are engaged should be investigated. The surgical side is also important and demands recognition and study.

THE ACTIVITIES OF A LABOR DEPARTMENT.

By Edwin Mulready, Rockland, Mass.,
Commissioner of Labor, Commonwealth of Massachusetts.

If one could appreciate the great industrial and social changes now taking place in every line of human endeavor, he would at once realize why it is necessary and desirable to have a State Labor Department. This is true in a special manner of an industrial Commonwealth like our own, where we have large communities entirely dependent upon factory and mill population, and where the concern of the mill operatives becomes the concern of all.

Intelligent employers of labor have come to realize, as never before, that the most valuable asset of the establishment is the well-paid, contented workman, laboring under conditions designed to conserve the health and general well-being of the employees. It is because all employers do not appreciate this fact that the State is obliged to enact laws which will compel certain individuals to adopt a system, which has, time and again, demonstrated its usefulness. It is well to be reminded that laws are made, not for the majority of our citizenship, but really to compel obedience by the minority. "Obedience to law is liberty," but some people have not yet received the gift of vision to recognize the truth of this principle, and hence obedience must be enforced. The so-called labor laws are no exception to this rule.

All laws relating to labor and the employment of labor are within the jurisdiction of the Labor Department of Massachusetts. Such laws, broad in their scope, must necessarily be made more inclusive in detail to meet the ever-changing industrial life of the community. If the worker is obliged to spend 50% of his working hours working under conditions which his employer has either created or allowed to exist, and which make for disease and premature death, then it is the business of the Commonwealth to recognize and improve such conditions. The world cannot stop in its march of progress, dangerous occupations cannot be entirely eliminated; yet, while we cannot remove all occupational hazards, we may, by a little care, reduce to the minimum these industrial dangers. This suggestion is not made in a spirit of philanthropy, but really in the interest of fair play, justice and sound business policy. It has been said that the individual worker assumes the risk when he enters the occupation. A moment's thought, however, will convince us that this is not a fair assumption. Indeed, the utter helplessness of the worker, so far as controlling the special hazards of his occupation is concerned, when once understood, awakens the interest of any right thinking person. A human being, who appreciates the fact that he is but one fifteen thousandth part of the plant in which he labors, quickly reaches the conclusion that it is not for him to "reason why," but that his part is to "do or die."

When the Labor Department receives thousands of complaints relative to working conditions, it is seldom found that there is not attached to the complaint a request—"please don't mention my name, for it will be the price of my job if it is found that I complained," etc. Do not misunderstand me; this may be in many cases just the "state of mind," but, nevertheless, we know that such an evil exists. We are not inclined to criticise too severely, for we have all seen great business establishments grow like mushrooms in the night; and the multitude of perplexing problems facing the management on every side, it is no small wonder that the "human side" of industry has often been neglected. In self-defense, the workers, through their representatives, have sought a remedy through legislation, and while in many instances the wisest remedy has not resulted, a constant struggle has been kept up. In this connection I desire to acknowledge, with sincere gratitude, the great contribution which has come from physicians in this effort for better working and living conditions. Indeed, the invitation to attend your memorable meeting of today was accepted without hesitation, because I have known of your interest in this direction.

The particular duty of a State is to protect the weak and those who are not in a position to protect themselves. It is a source of congratulation to every citizen in this old Bay State to know that when the Federal Government undertook to protect the children of the nation by the so-called "Child Labor Law," the Congress at Washington took the Massachusetts Child Labor Law for its model, and that next September, when this law becomes operative, those who observe the much-abused Massachusetts Child Labor Law will thereby observe all the essential provisions of the Federal Child Labor Law.

Massachusetts has always led in the protection which the law affords women who are obliged to labor. These laws have been the subject for severe criticism, and several cases have been brought in our courts to determine the exact status of women in the industrial field. Courts everywhere have uniformly upheld the theory that women should be protected by law from all kinds of overwork. The Supreme Court of the State of Illinois has used this language in defining the position of women in industry:

> "It is known to all men (and what we know as men we cannot profess to be ignorant of as judges) that women's physical structure and the performance of maternal functions places her at a great disadvantage in the battle of life; that while a man can work for more than ten hours a day without injury to himself, a woman especially when the burdens of motherhood are upon her, cannot; that while a man can work standing upon his feet for more than ten hours a day, day after day, without injury to himself, a woman cannot; and that to require a

> woman to stand upon her feet for more than ten hours in any one day and perform severe manual labor while thus standing, day after day, has the effect to impair her health; and that as weakly and sickly women cannot be the mothers of vigorous children, it is of the greatest importance to the public that the State take such measures as may be necessary to protect its women from the consequence induced by long, continuous manual labor in those occupations which tend to break them down physically. It would, therefore, seem obvious that legislation which limits the number of hours which women shall be permitted to work to ten hours in a single day in such employments as are carried on in mechanical establishments, factories and laundries would tend to preserve the health of women and insure the production of vigorous offspring by them, and would directly conduce to the health, morals and general welfare of the public.”

If such laws have been upheld under ordinary conditions, what shall we say of their value under the greater strain which has now come to the women and children!

We are at war with the greatest fighting machine the world has ever seen. Our young men, and perhaps our older men as well, will be called upon to follow the flag, and unfortunately no one is in a position to predict the time of their return to normal conditions. Last week we had the opportunity of meeting the representatives of the Canadian Government, having charge of the military hospitals, and we were amazed to find that in the nine Provinces of Canada, 94 such institutions had been found necessary. As we listened to the story we wondered whether the experience of Canada might not be duplicated in Massachusetts, and whether our people fairly appreciate the situation confronting them at the present time. In addition to this thought, it cannot be denied that with a million men in the field, there must necessarily come an enormous readjustment of labor and labor conditions. The United States must win this war, and as one means many persons have advised the entrance of women and children into occupations in which they were heretofore strangers.

The new law, which has given the Governor of Massachusetts such tremendous power, contains a provision, which calls for the organization of a Commission, consisting of two representatives of wage-earners and two representative manufacturers sitting with the Commissioner of Labor as Chairman, to determine all emergency work. While we may modify in some respects the rules and laws which have been enacted for the protection of women and children, we shall not, I trust, tear down the standards which have been raised, and which have stood for a better American womanhood and childhood,—the two great assets of a free Republic.

The statements which have been made are an indication of the place which the activities of a Labor Department should occupy in a progressive, industrial State; and now, in no spirit of egotism, I desire to call your attention to the work of the Massachusetts Labor Department for the year 1916. It has been suggested that we should have an industrial census, taking an inventory of our different industrial parts. In Massachusetts we have 70 large plants manufacturing munitions of war, employing over 57,000 employees, two-thirds of whom are women and children. The proper inspection of these plants, with their ever-changing problems, would constitute a work sufficient for all our inspection force. We have not confined our efforts, however, to this work, but in the year 1916, 30,617 industrial establishments were inspected; 11,212 reinspections were made; 41,829 being the total of inspections and reinspections; 12,010 orders were issued to correct conditions existing contrary to law; 10,475 of these orders were complied with; 3,284 orders pending at the close of the year; 189 cases of industrial diseases were reported by physicians; 3,028 complaints were received; 3,430 orders were issued in relation to the hours of labor by women and children; 557 in relation to Sunday employment; 2,132 in relation to educational and employment certificates for children; 735 in relation to dangerous machinery; 3,344 in relation to improper toilet facilities; 1,078 in relation to medical and surgical chests; 323 in relation to insufficient ventilation, etc.

The physicians of the State have responded to our request for reports on occupational diseases in a splendid manner. It may not be fair to say that there are more occupational diseases than ever before, but it is a fact that more cases are being reported. In the year 1916, 182 reports were received, while for the five months up to May 31st of the present year, 151 reports had come in. Take the disease of anthrax alone: we are told that in the Massachusetts General Hospital in 23 years only 36 cases were reported, while in the year 1916 we had 27 cases—4 fatal; and for the past five months we have reports on 24 cases—3 deaths. I would not weary you with statistics, but believe that the figures given are an indication of the great amount of work which was absolutely necessary in order that better conditions might exist in industry.

The privilege of speaking at your meeting is fully appreciated, for by it there was created an opportunity to call your attention to the activities of a Labor Department, but if the matter is allowed to rest there, I feel certain that my intrusion on your valuable time will not be justified. May we not expect that as a result of this visit you may reflect on the possibilities of still greater coöperation with the Labor Department; that we may, by such coöperation succeed in the formulation of a plan by which we may together aid in the betterment of the laboring population, and thus produce a higher and better grade of American citizenship in this great industrial Commonwealth!

The Adjustment of Physical Defectives to Employment.

By W. Irving Clark, M.D., Worcester, Mass.

The awakening interest in the health of the workingman, which was just beginning to show in the United States five years ago, has been stirred to unwonted activity by the war.

INDUSTRIAL EXPANSION.

The lack of immigration, and finally the prospect of losing a large proportion of young men through draft, has brought home to the employer the tremendous importance of the workingman as the basis of his business. For some years employers have been studying the rapid turnover of labor in the factories, and the endless waste which it involved,—an economic waste not only to the factory but to the workmen as well. Efforts to meet this have become more and more organized. Employment departments have been established and every effort made to select the workman for the work to which he is best trained, and at which he is most likely to remain. It was almost immediately seen that, although some men might be well adapted, through training, for certain work, on account of their physical condition they are not able to stand the stress and strain, and therefore valuable members of the community were soon worn out, and obliged to adopt other lines of work, for which they were not well trained, and from which they derived only a small proportion of wages which were due them. In order to meet this difficulty, medical supervision of employees was adopted by many large factories throughout the country. It was at once found that the only way the physical condition of the employees could be ascertained was by physical examinations. These examinations were in some cases made after the employees had been hired, and in others upon applicants for positions. The examinations revealed several interesting facts: First, that the workingman, unless influenced by some labor organization, did not object to physical examinations, but rather appreciated their value to himself. Second, that many men applied for positions in a factory for which they were physically unfit. Third, that the majority of applicants had numerous defects of a more or less serious nature, which were amenable to treatment, or which could be improved by selecting the work for which the applicant was best physically fitted. It was also found that hard work had a tendency to reduce the applicant's ability to fill a position, because of his physical defects, after the age of forty-five. The employer was therefore confronted with the problem of: (1) whether to reject men who were totally unfitted for the work, or to try to adapt the work to the man's physical condition so as to make use of him; (2) whether something could not be done to prevent beginning defects from becoming more pronounced, and finally becoming so severe that the man's occupation would have to be changed; (3) whether a great many of the defects which were found in older men were not due to the neglect which their physical condition had received during their previous work. It falls to the doctor to meet and answer these problems. As a result of work extending over about five years, the industrial physicians of the United States have gradually worked out the answer. Briefly to outline this answer, I am submitting this communication:

GENERAL PLAN OF MEDICAL SUPERVISION.

The factory equips one or more hospitals, in charge of nurses, and places in charge of the department a doctor, who usually has one or more assistants, depending on the size of the factory. An employment department examines each applicant for his fitness to fulfill a given position, just as the doctor examines a man physically. After the applicant has been approved by the employment department, he is sent to the health department for a physical examination. This examination is made with about the same thoroughness that an army recruit receives. All defects are noted and summarized, and the doctor then decides whether the applicant is fitted for the position to which the employment department has assigned him. If not, the matter is taken up with the employment department, and some suitable work is found for the man. Thus the employment department is often obliged to adjust the man's work to his physical condition, while in other cases the doctor is obliged to adjust the man's physical condition to the work. This latter phase will be discussed more fully later. After the employee has been assigned to work, his physical examination card is filed, and he is privileged to use the shop hospital for every accident and every attack of sickness which he has while he is working. Owing to the Workmen's Compensation Act, prompt reporting at the hospital for accident is enforced by the foremen, and reporting for sickness is simply advised, but the employee is quick to appreciate the advantage of a doctor at his elbow, and is constantly applying for help in trivial and severe sickness. In this way a constant record of the man's physical condition is maintained, each visit to the hospital for sickness or accident being carefully noted on the employee's record, so that any change in his physical condition can be rapidly noted. It will thus be seen that defects are found, first during the physical examination of the applicant for work, and later, as they arise as a result of sickness or accident.

Defects may be divided into three classes: first, defects which are general in character; second, defects due to accident; and, third, defects due to previous sickness. General defects are usually the result of a subnormal condition. The employee appears as a poorly nourished individual, usually anemic. The type of actual defects from which he suffers are hypertrophic tonsils, a deviation of the septum, spinal curvature, relaxed inguinal rings, and possibly a cardiac murmur. Men of this type require careful medical supervision. It is usually found that their home living conditions are poor, that they are getting an insufficient amount of sleep, and that the type of food which they are using is incorrect. Such defectives are employed in considerable numbers in all factories. The doctor's effort in these cases is not only to place the individual at work which is not too severe for his faulty development, but also so to guide his methods of life that the numerous defects may be, to a certain degree, overcome, or at least improved. It is obvious that men of this type are unfitted for heavy work; by heavy work is meant general laboring, work in departments which require heavy lifting, and departments where the ventilation is poor or where there is much dust. These employees are the pre-tubercular type, and it is well to examine their lungs at stated intervals. The second broad type—those whose defects are due to previous accidents—may be divided into two classes: those due to a recent accident, from which they have just recovered; and those due to an accident occurring one or more years previous; the latter class are, of course, deformities. The placing of the employee defective from a recent accident requires considerable ingenuity. The doctor always endeavors to place him at work which is as nearly as possible that which he was doing at the time he was injured, principally because this is the easiest work for him to do. It is surprising how rapidly men will resume their original work with comparatively severe injuries of not more than two fingers of one hand, provided these fingers are adequately protected. The great majority of injuries occurring in factory work are to the fingers, and much of the lost time is due to fear on the part of the employee that he will further injure the affected finger, either by the work or by striking it against some part of the machine. Adequate protection can be procured by the use of the Brant splint, or the tin cross-piece suggested by Dr. Manning, of the Government printing-office. The machinist is more or less inventive, and can often devise some method by which he can handle his work for himself, if he is assured by the doctor that no injury to himself will result thereby. At Norton Company we have repeatedly had cases of employees who, after sustaining a traumatic amputation of part of a finger, have returned to work the next day, and we have also had men continue working with a broken finger, after this had been splinted with a Marsee finger splint. When it is impossible for a man to return to his original work, work as closely approximating it as possible should be found; and if, as in the case of a strained back, it is impossible for the man to do the heavy lifting required, the nearest available helper should be instructed to assist him, while some apparatus should be arranged by which the work may be put upon his machine by mechanical means.

Defects from a Previous Accident. These defects will probably be most important during and after the present war, but many of them are appearing daily at factories at the present time. Such defectives are one-eyed men, one-armed men, one-legged men, and men suffering from similar deformities. The problem of placing defectives of this type has been made additionally difficult by the Workmen's Compensation Act; thus the factory realizes in hiring a one-eyed man that in event of his losing his eye, it or the insurance company will be responsible for total blindness. In the same way, a man with one arm, receiving a serious injury to that one arm, becomes a dependent upon insurance for a long period of time. The result is that, except where the employee has lost his eye or some other member while in the employ of the factory, it is extremely difficult for such defectives to obtain work, even though they are competent workers. This seems a grave injustice to the employee, but the injustice would not be present if the law were made more reasonable for the employer. The one-eyed worker may be placed in any department with perfect safety if he consents to wear a goggle of the dust-safe type. This absolutely protects the eye; the only difficulty being that the employee frequently fails to carry out his part of the contract and wear the goggle while working. If the responsibility of the factory for injury to the remaining eye ceased after a pair of this type of goggles had been issued to the employee, one-eyed men would find little difficulty in obtaining employment. One-armed men are usually very dexterous, and are frequently capable of doing good work in certain parts of a machine shop. I have been much impressed by the possibilities of artificial arms now on the market, and I feel that if, in the future, factories are obliged to take one-armed men, that excellent work can be obtained from these men if in some way artificial arms can be procured for them and they can be taught to use them. One-legged men are not much handicapped in most departments, provided they have a well-fitted artificial limb, and ordinary common sense is used in the selection of their work. The same is true of old fractures and flat-feet. In cases of this type, proper instruction and supports will almost always allow a man to do good work. In cases of deformities of the legs and feet, it is not so much the type of work which the man does as the posture in which he does it, and the type of shoes and supports which he wears.

Hernia. Hernia is one of the frequent defects met with when examining applicants. In many cases the man is completely unaware of the defect, it having caused him no trouble at any time. I have been interested to note that large, complete old hernias have existed for years without causing any inconvenience. Of course these hernias are potentially dangerous, and the employee should always be advised their operative cure or the wearing of a truss. I see no reason why a workman with a well-fitting truss, which satisfactorily holds the hernia, should not be assigned to any department where there is not very heavy lifting to be done. The difficulty with these men is that in hot weather they are apt to remove their trusses because of discomfort, or that for some other reason they fail to wear them. It is for this reason that many large factories refuse to take on their force men with hernias.

Defects Due to Previous Sickness. Defectives of this type may be roughly divided into two classes,—those due to chronic or metabolistic disorders and those due to some previously acute condition. In the first class belong cases of diabetes, high blood pressure, arteriosclerosis, and nephritis. Workmen of this type require more medical supervision than careful placing in the factory, though of course it is obvious that men with high blood pressure, arteriosclerosis, etc., should not be given work of an exacting type, where speed and heavy labor are combined. The workman of this type in my experience is usually a man of 45 years or over, whose defect has been present over a long period of time, and who has naturally adapted himself to it in selecting his type of work, so that these men instinctively apply for work to which they are fitted. Of course this is not always the case, but its frequency is interesting. The defectives applying for work, with defects the result of previous acute disease, are mostly cases of endocarditis or tuberculosis. The first of these conditions is fairly safe in any position in the shop except those where there is great heat, great humidity, or excessive physical work. In saying this I am supposing that compensation is complete. Of course, if compensation is disturbed, very light work must be selected for the employee, and if it is broken I do not believe that he should be allowed to do any work at all until compensation is fully restored. My experience with hearts has been that it is not the factory work which harms them so much as what happens outside of the factory. Thus one of our employees was specially trained as a blacksmith; he had, however, an hypertrophied heart with chronic valvular disease. I told him that it would be impossible for him to continue the heavy work of a blacksmith. He asked me if it would not be possible for him to continue if he stopped outside athletics. I decided to try what the effect would be. In the course of two years his heart had come in two inches, and at no time was there the slightest sign of disturbed compensation.

Tuberculosis, when arrested, is no bar to employment in a modern factory. Of course the work must be selected and the patient watched, but many cases will do moderately hard work for years without breaking down or signs of activity. Active tuberculosis has no place in the factory.

From the above it will be seen, first, that in many cases it is unnecessary to reject defective employees applying for positions, even though the defect be regarded as severe; second, that medical supervision has a tendency to prevent beginning defects from becoming more pronounced; and, third, that by the supervision of the employee and the close personal touch which the doctor is able to maintain, many defects, which are now found in older men, may be prevented from appearing in the present generation.

The Establishment of a First-Aid Hospital in Industry.

By Herbert J. Cronin, M.D., Cambridge, Mass.

Industry needs today the physician to help it conserve its workers from the results of disease and accident. The unlimited supply of foreign labor has ceased and may never be resumed. War will drain hundreds of thousands of young men from industry and further diminish the present supply of labor. Industry may be forced to use classes and types of labor previously considered unsuitable. With such possibilities of a scarcity of labor, it is essential that the fullest efficiency of the present workers be maintained. Such efficiency means that the worker give his best effort during working hours, and that he lose no time through accidents or sickness. The physician can aid industry to develop this efficiency.

Industry must produce unlimited war supplies if we are to win the war. Such supplies include nearly everything that is used in civil life, in addition to munitions. England made serious errors in her treatment of industry. Skilled workers were enlisted in the army and replaced by unskilled men and women. Longer hours, attempts at speeding up, larger forces of labor—all were unsuccessful, and production decreased. The army could not proceed, conditions were critical. Production was increased only by a return of the skilled workers and a re-establishment of the former working conditions.

Now in this country, with war conditions as an excuse, an attempt is being made to abrogate the labor laws that have been developed after years of study and effort. Proposals are made to lengthen the hours of labor, and modify the regulations for the work of women and children. All such legislation should be forcibly opposed, because not only will it injure the health of the workers but it will not accomplish the results claimed by causing a larger production.

A bill is before Congress to establish a Public Health Officers' Reserve Corps. Provisions are made in this bill for the maintenance of a force of physicians to guard the health of industrial workers and maintain their efficiency during the war. Industrial physicians should enroll in this corps if it is established. It will in no way conflict with the Medical Officers' Reserve Corps nor free a man from active service.

THE FIRST-AID HOSPITAL.

The establishment of a first-aid hospital in the factory is the first step that should be made by the physician who assumes medical direction of an industry. With the hospital as a center, all other medical activities for the plant can radiate. Careful study of the individual plant will decide the best additions to the medical service.

The hospital should be situated near the center of the plant's greatest activities. The building should be quiet, as pounding and vibrating machinery prevents careful stethoscopic examinations. Good light, and accessibility to the employees and the ambulance are also required. The size of the hospital depends entirely on the number and sex of the employees, as well as the character of the work. A plant with many women employees requires a large number of beds. Provided asepsis is complete, a relatively large amount of work can be done in a small dressing-room.

Hospital Equipment. The equipment should include an outfit of instruments that would be suitable for minor surgery; a few eye, ear, nose, and throat instruments, the common surgical drugs and solutions, and an instrument and dressing sterilizer. There should be running water, either in a sink or a lavatory, with a toilet in the room or nearby. The furniture needed is a few steel chairs, dressing tables, instrument cabinet, examining table, screens and a cot, with the usual office furniture, as a desk, typewriter, and records.

The construction of the hospital is limited by the appropriation granted, but if this is moderate, it is best to install a composition material floor. The walls may be painted with a white enamel paint or finished with porcelain brick, which will easily wash. Prismatic glass in the windows is opaque and diffuses the light without shadows. Hanging, reflecting electric lights give a soft light throughout the room, while a nitrogen stand-light is indispensable for close work. A cot built like a small hospital bed is more satisfactory than the regular bed, because a patient will throw himself on the cot who will not lie in a bed. Black rubber sheeting can replace linen sheets on the cot and the table.

A graduate nurse who is skillful with surgical dressing is essential. The routine clerical work can be done by a stenographer. In the average small or medium-sized plant, a physician is needed but part of the day. An hour or so every day, or even every other day, can accomplish much. In the larger industries that can afford to have continuous medical service, it is debatable whether the employment of several part-time men is not better than the full-time man.

Necessary Diagnostic Aids Not Needed in the Hospital. An x-ray machine is not needed in the average first-aid hospital. It is more economical to make arrangements with some local institution for the taking of plates. Examinations of throat cultures, blood smears, Wassermanns, sputa, and Widals can be done at the state or city board of health laboratories without expense. The free anti-tetanic and diphtheria antitoxins of the state can be used, as well as the smallpox and typhoid vaccines. Thus a physician can bring to the industry all the aids to diagnosis and treatment that are used by him in his private practice.

A plant hospital should be operated strictly as a first-aid hospital. Cases should not be kept there more than a few hours, and if further treatment is required, they should be transferred to a local hospital. For this purpose, arrangements should be made with some hospital to receive all cases sent by the factory, and the plant physician allowed to treat the cases, or act as an associate consultant. For transfer of the patients, a satisfactory ambulance service is essential.

Group treatment is insured in difficult cases by making arrangements with a group of specialists to consult and treat the cases with the plant physician. The insurance company which carries the compensation insurance will provide their staff specialists in compensation cases.

Duties of the Hospital. The hospital should treat all cases of accident and sickness that occur inside the plant, and medical conditions that arise outside the plant which interfere with the employees' efficiency. The hospital duty is to keep the men able to work and in the plant. An employee cannot give full service if he has a throbbing abscess, but open the abscess and he returns to work with a different spirit. Traumatic cases return to work immediately if they receive satisfactory attention. The treatment a few minutes after the occurrence of an injury prevents the introduction of infection, with the possibilities of prolonged incapacity. Where men are unable to resume their former occupation after an accident, a slight readjustment of their duties by the physician may keep them in the plant. The men like a first-aid hospital because they lose no time from slight injuries, while it is satisfactory to industry because the men are held in the plant.

FIRST-AID STATIONS.

First-aid stations should be established at convenient points throughout a factory. Such a station consists of a stretcher with blankets, and a first-aid jar, containing the necessary first-aid equipment. The Army and Navy stretcher is the most satisfactory one for this use; it is six feet long, folds together, and has feet so that it can be used as a cot. Blankets are folded in between the poles, are easily accessible and always clean. For delirious or unconscious patients, long straps of leather or canvas should be included within the stretcher, to prevent unskilled stretcher-bearers from rolling the patient off the stretcher.

The best first-aid outfit—small but yet complete—is the standard first-aid jar of the National Affiliated Safety Organizations, which was designed primarily for industrial use. The jar should be placed in a glass-sided cabinet. A few packages of sterile sponges should be included within the cabinet. If there is a first-aid hospital in the plant, the jar should be used for emergencies only, or at night when the hospital is closed. The jar is very convenient for the physician or nurse when attending cases in the factory that could not be removed to the hospital. Immediate attention can be given the patient with the materials at hand.

The N. A. S. O. First Aid Jar

The jar is made of heavy glass, the contents are visible and easily accessible. Any ordinary emergency can be handled with the materials in the jar and it can safely be entrusted to laymen.

The use of the first-aid stations must be familiar to the employees. Selected men from each department should receive three or four lectures on first aid. It is best to confine these lectures to the barest essentials of first aid,—how to stop hemorrhage, first dressings, transportation on the stretcher, and resuscitation. Special stress should be given the particular hazards of the industry.

Use of the First-Aid Station. When an accident occurs in a department, the foreman sends for the nearest stretcher and jar. The patient is placed on the stretcher and covered with blankets. The straps are applied over the thorax and the legs. The nurse, on arrival, takes charge of the case. If it is merely a fainting attack, the patient is removed to a quiet corner, with as little commotion as possible, and there allowed to recover on the stretcher, which acts as an excellent cot. The more serious cases are transferred to the plant hospital, and if they need prolonged bed treatment, are removed to an outside hospital. They are kept on the plant stretcher, and are not moved from it until they are put to bed. This insures that the patient is warm, comfortable and secure, while the discomfort and shock caused by handling the patient is obviated.

A STUDY OF THE PROCESSES IN THE INDUSTRY.

The particular health and accident hazards of the industry should be studied by the plant physician. All the processes of the industry and the chemicals used should be known. Consultation with the plant chemist will aid the physician in gaining this knowledge. Employees may be totally ignorant of the materials handled, and it is difficult to instruct them on the dangers, because they may be stampeded and leave their positions. The chemicals and processes of every industry cause diseases and physical conditions due to such processes. For instance, severe abdominal pains, that simulate appendicitis, may be the beginning of lead poisoning; skin diseases may be caused by chemical irritants; and bronchitis by the gas and fumes.

CARE OF WOMEN EMPLOYEES.

The care of the women employees is a special work in itself. The accidents to women are usually minor contusions and lacerations. The acute illness of menstruation, often with syncope, is the commonest medical condition. When a girl faints in a large department, the work of the department may be disrupted for some time. Immediate attention by the nurse, the placing the girl on the cot-stretcher, and removal to a quiet corner till she recovers, will return her to work perhaps within an hour. The mental effect of the immediate treatment and quick recovery is excellent on the rest of the employees. Sanitary napkins should be supplied the girls at the first-aid hospital.

VISITING NURSE.

The visiting nurse is a valuable adjunct to the first-aid hospital. The nurse visits the homes of the absentees to find out if they are sick, and if so, are they receiving adequate medical treatment. Many of the foreign-born laborers cannot speak English, live in squalid conditions in boarding houses, and when they become sick, may lie for days unnoticed. If the nurse reports conditions unfavorable, the plant physician can use all the medical agencies for the treatment of the case that he would apply to a charity case in private practice. The case might be sent to the municipal hospital, or the public or private charitable societies asked to give their assistance. Proper medical attention means an early return of the man to industry.

PHYSICAL EXAMINATIONS.

The physical examination of employees engaged in hazardous occupations is also a part of the work of the hospital. Periodic examination, with instructions, of the men exposed to poisonous processes will prevent future sickness. The examination of all employees before employment, to discover if they are suitable for the work, usually requires larger and separate quarters than the first-aid hospital.

The work of the physician in industry is practically unlimited. He can branch out into many fields of activity. He can be a large factor in the campaign to prevent accidents; he can supervise the sanitary conditions of the plant; can advise the management on questions of proper lighting, heating, the humidity, fatigue, and the prevention of dust and fumes.

War may return many of our young workers partly maimed,—an arm or a leg gone. Society will not be able to care for them, and they will demand a chance to make a living. Industry must find a way to utilize these men. The physicians can aid in providing suitable artificial limbs, and by placing them at work they will be able to do.

DISCUSSION.

Dr. A. N. Broughton, Jamaica Plain, said that very few employers appreciate the value of a complete hospital equipment, and it is a matter of education to get an equipment such as is provided by the Norton Company of Worcester. Viewed in the right light, it is a saving of expense. There is no reason why a city or town should bear the expense of establishing and maintaining an x-ray outfit or a diagnostic laboratory, and there is at present no comprehensive plan for taking care of industrial injuries. The matter should be studied on a broad scale, and facilities should be provided.

Dr. J. J. Minot, Boston, spoke as the chairman of the Committee on Health Industry of the Boston Association for the Relief and Control of Tuberculosis. He said that this committee is now in its third year. Its object is to get employers to have a nurse who is trained in public health work, in their employ. Members of the committee visit employers of all kinds, factories especially, which employ enough hands to make it possible for them to have a nurse. We explain and show the value of it. When a nurse is employed she is in constant attendance, cares for all accidents as they occur, handing them over to physicians after the first dressing; she sees anyone who feels sick, who needs aid or assistance in any way—physical, mental or moral. She looks after the general hygiene of the factory, gives noon-talks on health, visits the houses, helps in matters of feeding and care of children, and assists in family economies. At first it took a good while to get a hearing from the employers; now they are beginning to understand the value of such a person, and we are consulted by many, some even from a distance. We gladly find a nurse for anyone who can be persuaded to take one, and in case there are not enough employees to warrant a full-time nurse, we arrange for part-time nurses. Rest rooms and rooms in which to do dressings are arranged for under our supervision. In our experience, no one who has ever employed a nurse has given her up. Where there are many employees, we try to have physicians employed, as well as nurses. Only the highest grade trained nurses are sent out. We supervise them for some time, but have no responsibility and make no money charge. Recently the Anti-Tuberculosis League has joined with us, and now we undertake the work for the entire State, feeling that our efforts have been of great value to the community.

Dr. E. J. McCarthy, Malden, would like to know how many physicians in the State are being employed in commercial establishments. This institutional work is a wonderful opening for the physician. Much work has been done to prevent accidents from machinery, but the health aspect has been limited; the hazards from dust and gases must be taken into consideration. He thought that the medical profession should take up the problems of industrial diseases and give them intensive study; the general practitioner should be awakened to appreciate the many aspects of industrial diseases.

Dr. A. N. Broughton emphasized anew the need of education of the employer and the insurance companies, who were only too apt to get the cheapest medical attendance that they could, thus often depriving the employees of adequate care.

Original Articles.

CHANGING METHODS AND ADVANCES IN THE TREATMENT OF PROGRESSIVE DEAFNESS FROM CHRONIC SECRETORY OTITIS MEDIA.*

By Francis P. Emerson, M.D., Boston

Instructor in Otology, Harvard Medical School; Assistant Surgeon, Massachusetts Charitable Eye and Ear Infirmary

For the reason that otology is not an exact science, there are problems connected with its practice that should be reconsidered at stated intervals. One of these is the diagnosis, prognosis and treatment of that form of progressive deafness which is the result of chronic secretory otitis media.

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* Read before the American Laryngological, Rhinological and Otological Society, Atlantic City, May 31, 1917.

Previous papers on this subject were read before this society by Dench in 1894, Harris in 1908, and by Holmes in 1912. These three papers are the only ones of record, with the exception of Reik's paper on the relation of the tonsils to middle ear deafness.

The discovery of lymphoid hypertrophy in the vault of the pharynx, and the recognition of its relation to the Eustachian tube by William Meyer, marked an epoch in the prevention and treatment of this form of middle ear disease. This was fifty years ago. Following this discovery, the further appreciation of the close relationship of the nasopharynx to the middle ear made the organization of this society a logical step. A large proportion of its present membership was educated first as otologists, and they have since studied and treated the nasopharynx only so far as, in their judgment, such treatment, operative or non-operative, could influence the prognosis of progressive middle ear disease.

In consulting the files of this society, we find frequent reference made to the necessity of stopping infection by way of the Eustachian tube. Hardly a writer, with the exceptions noted, has ventured clearly to define what he considered to be indicated along this line. The teaching in our universities makes no attempt to correlate the two subjects of rhinology and otology in such a way that the student should know what to do, and what not to do, rhinologically, to influence the middle ear. Each student is left to work out his own clinical experience, beyond instruction which relates specifically to the vault of the pharynx.

Observation among the leading otologists of today would lead us to infer that we are divided into two classes in our efforts to protect the middle ear. In the first class are those whose treatment is almost wholly confined to the epipharynx and Rosenmüller's fossae, to such an extent that it is a common practice for their patients to consult them as aurists, and their confrère, as a rhinologist. In the second class are those who correct all deformities of the septum, abnormal conditions of the turbinates, drain the sinuses, remove tonsils, etc., and in fact do what any rhinologist would do, and believe that in so doing they retard or check the progress of middle ear disease.

The writers of our latest text books give very scanty reference to remote foci, in discussing the etiology of chronic secretory otitis media.

In order that the writer might not misconstrue the attitude of the first group, namely, those who lay especial emphasis on the epipharynx, he sent the following question to fifteen prominent aurists: "Given a case of progressive deafness as the result of chronic secretory otitis media, where the hearing for the whispered voice has been reduced to 15/25ths, or less, would you expect any improvement from treatment of the nasopharynx, excluding the epipharynx and inflation?"

Replies were received from ten, all of whom said they would not expect any benefit, provided the lymphoid tissue in the vault and fossae had been thoroughly removed. One considered such a case as a beginning otosclerosis, and one had seen active operatives measures do harm. In order to prove that positive improvement in hearing results from the cure of remote foci is not an easy problem, as the testimony of the patient or of the aurist is of no scientific value, unless such observations are supported by careful hearing tests, and records covering a term of years, for we are dealing with a chronic disease, which is subject to acute exacerbations, and varying acuity of hearing.

Further, in order that such records should be available for analysis, such observations should extend over a period of from three to five years.

It would seem appropriate, after this length of time, to consider again whether we have made any advance in the treatment of chronic deafness over the pioneer work of Meyer and Tonbyee fifty years ago. Their work has since been elaborated by Politzer, Lucae, Sieberman and others, but the essential facts are unchanged. Can we, today, offer any more hope to this unfortunate class of patients who comprise such a large part of our clientele? If some of them can be helped, is it possible to predict, as a result of examination, that good results will follow our treatment in a given case, and how far any lost hearing may be restored?

In order that we may discuss this subject from common premises, let us define what we mean by chronic secretory otitis media. In a given case, otoscopic examination would show a dull grey, or ground glass appearance of the membrana tympani, absence of the light reflex, and retraction. The clinical picture would be one of slowly progressive loss of hearing, usually more advanced in one ear, with or without tinnitus. The hearing test would show a positive Rinné, the Weber lateralizing toward the more deaf ear. The low note by the Dench fork is unchanged, or slightly raised. The bone conduction is unchanged. The whispered voice, however, may be reduced to as low as 2 to 15/25ths. Given such a case, what conditions, if any, outside of the treatment of the epipharynx will influence its slowly progressive course? Whether any of the lost hearing can be restored is of the greatest importance to the patient, for the restoration of one or two notes in the upper register will determine, to a marked degree, the efficiency of the individual.

In order that we may definitely promise ourselves, or the patient, that the hearing will improve, the writer is guided by the following considerations, all of which depend on the question of re-infection.

It is his experience that in every case of progressive deafness from chronic secretory otitis media, there is a primary focus, which is constant for that individual. This may become quiescent, but in the interval it remains as a low-grade process, subject to acute exacerbations. This point I wish to emphasize, for until the primary focus is drained and cured, such acute exacerbations are a constant menace to the Eustachian tube and middle ear. The course of the disease will be from bad to worse, and a little more rapidly if inflation is practised as a routine.

That there are pathogenic bacteria in the mouth and pharynx at all times is common knowledge. That they possess sufficient virulency under favorable conditions to cause serious pathological conditions in remote organs has been proven by the investigations of Miller, William Hunter, Billings and many other observers.

Depending upon the organism, and the virulency of the infection, the clinical picture is one of toxemia, septicemia or pyemia, running an acute or chronic course. While this work is of recent date, all such facts had been observed years ago by Professor Arkovy of Budapest from '78 to '98, substantiated by the painstaking microscopic findings of Miller of Berlin, from '84 to '94, and by the clinical experience of William Hunter of London, who published his results in *The Practitioner* in 1900. Miller, who was educated as a physician, and also as a dentist, showed bacteriologically that focal processes in the teeth, tonsils, or sinuses kept up a low-grade infection of the adjacent tissues, and during exacerbations this might extend by continuity, or directly by way of the lymphatics, or blood stream to neighboring, or remote organs. That such low-grade infection is constantly present either in the epipharynx, or quite as often at some other point in all cases of progressive chronic secretory otitis media, has been the observation of the writer for many years.

In order to determine where this primary focus may be, we inquire of the patient, in taking the history, where these acute exacerbations begin. It is a well-known clinical fact that patients subject to acute infections almost invariably claim that for years such infections commenced in a certain manner, *i. e.*, as a sore throat, and then went up or down, or started as a head cold, and then went down.

In a given individual, this onset is almost constant, and does not usually alternate over many years, and indicates that the primary focus does not entirely subside, but becomes quiescent, and is subject to acute exacerbations, whenever the resistance of the host becomes lowered. This then gives us our first clue as to where we shall begin our treatment, and cannot be determined by the anatomical conditions of the nares, even if a rhinitis be present. The next question is to ascertain if the hearing varies, *i. e.*, whether it is better on some days than others. In such cases an active cause of the otitis is still present outside of the middle ear, and we can usually hope for improvement up to their best hearing, or more, if we remove the original focus, and clear up the accompanying infection.

Let us suppose a case where the history points to the acute exacerbations being more or less constant in the nose. It is the writer's opinion that no amount of anatomical deformity of the septum influences the course of chronic secretory otitis media until after infection takes place, but that such deformity predisposes to infection.

The tendency to a low-grade infection in the nares is promoted by the following conditions. Given asymmetrical nares from deviation of the septum and there results a compensatory hypertrophy of the turbinate on the concave side from over-function from nature's attempt to equalize the air current. As a result, the soft tissue goes through the various phases of congestion, increased connective tissue and thickening of the mucosa. At this stage any acute infection, on account of defective drainage, may be continued as a low-grade process subject to acute exacerbations. With the defective drainage, if a new infection is virulent enough, the sinuses may become involved. We therefore operate in the nares, not to remove a mechanical obstruction *per se, but to improve drainage and clear up the attending infection.*

To one who accepts this pathology, it is essential to the integrity of the tube and middle ear, that the infections of the nasopharynx should be cured so that acute exacerbations may be prevented. This can be accomplished only by improving the defective drainage, and equalizing the air pressure by reconstruction of the nasal chambers, *i.e.*, straightening deflected septa, removing redundant tissue from the turbinates, reducing posterior hypertrophies, and opening all infected cells.

After this, it is equally important in cases of deafness of long standing, that no low-grade process persists, as an epipharyngitis, or some focus be left that may still be subject to acute exacerbations, and thus offset the effect of our operative procedures as far as improvement of the Eustachian tube is concerned. The middle ear condition grows progressively worse by reason of re-infection from the same primary cause, or from secondary foci, until the hearing is beyond improvement. For this reason auditory re-education by whatever means—inflation, electricity, etc., that does not take into account the underlying cause—cannot be of permanent value until such focus is removed.

Pharynx.—In the pharynx all lymphoid tissue, however small, should be removed, including bands between the Eustachian tube and the pharynx, and degenerate tissue in Rosenmueller's fossae. Where posterior rhinoscopy shows chronic congestion on the lateral pharyngeal wall, the condition of the fossae cannot be determined without a digital examination. Chronic pharyngitis indicated by a glazed appearance of the posterior wall, and a change in the secretions, the writer has always found to be due to caries in the sphenoid, either alone, or in connection with a pyogenic focus in the posterior ethmoids; and the so-called pharyngitis sicca he has not found to exist as an entity. While the diagnosis cannot be made with an ordinary probe, it usually can be made by using one whose shank is no larger than a knitting needle, and that has a fused bead on the end.

Tonsils.—The tonsils in their relation to local and systemic disease are only beginning to be appreciated, especially when found in adults between thirty and sixty years of age. As we now understand their pathology they account for many of the diseases that were supposed to be constitutional, such as scrofula, rheumatism, auto-intoxication, etc. Visual examination is useless. The anterior pillar should be pulled forward, and pressure used between the outer wall and the tonsil. In many cases where the tonsil is an active cause of the deafness, free pus will be demonstrated on one side, usually at the junction of the vela lobe, and the middle third of the tonsil, particularly in those cases showing toxemia. This is an enclosed abscess of streptococcus origin and subject to repeated acute exacerbations. The toxemia is marked, and it is probably the cause of chronic nerve degeneration in the labyrinth. Such cases are attended constantly by a low-grade pharyngitis. Reik, in his article published in 1908, on degenerate tonsils and middle ear deafness, has fully described their relation to the Eustachian tube.

In the writer's experience the extension to the Eustachian tube is more often by continuity and through the lymphatics and blood stream along the posterior pillar. The resulting low-grade process can be seen not only on the lateral wall, but in the epipharynx, and over the surface of the posterior nares, as well as in the mouth of the tube.

Eustachian Tube.—The pathology of the tube in its relation to middle ear deafness, the writer has usually found either at the isthmus, or the pharyngeal end. Examination shows the tube, if the process has existed long enough to affect its lumen, as it usually has in *chronic cases*, more widely open on the side of the more affected ear, hence inflation is not only counter-indicated, except for diagnostic purposes, but it makes the loss of hearing more rapid. Indeed, after stopping the infection, one of the next steps in our treatment is to try to restore the lost tone of the pharyngeal end by applications within the tube, and exercises that will strengthen the function of the palatine muscles. The most experienced aurist will be deceived as to the lumen of the tube by auscultation, as very many cases have a decided narrowing at the isthmus when inflation seems clear. If no mechanical obstruction exists at either end of the tube, nature has provided for sufficient ventilation of the middle ear. If such obstruction does exist in *chronic cases,* inflation will do no good, and will add to the gradually diminishing function of the tubal muscle. Applications within the tube are of great benefit, but they should not be repeated too often, or be strong enough to excite too much reaction. This reaction, where the obstruction has been at the isthmus, has been one of the most difficult things for the writer to control in the treatment of the tube.

The Alveolar Process.—The best work on the pathology of the alveolar process has been done by dentists. The relation of such foci to local and systemic disease has been repeatedly called to your attention by Dr. Haskin. Miller, of Berlin, in 1894, showed the seriousness to a patient with low resistance of pulpitis, gangrene of the pulp, pericementitis, alveolar abscess, ostitis, osteomyelitis, periostitis, alveolar necrosis and pyorrhoea. He called attention to the fact that pyogenic organisms, associated with osseous necrosis, were very virulent, and that the soft tissues over a considerable area showed infection. His bacteriological findings proved that such local foci might involve not only adjacent tissue, but extend by continuity to the tonsils, and pharynx, or through the lymphatics or blood stream to distant organs. For our purposes such diseased conditions should be investigated in conjunction with a dentist, and all devitalized teeth examined by an x-ray, as part of our routine examination in locating foci that may be the cause of a progressive chronic secretory otitis media.

It is often asked why, if such causes are active in the etiology of chronic secretory otitis media, it is not easy to settle the question by producing a series of cases corroborated by hearing tests. The answer is because of the fact that such foci are usually multiple and few men have systematically attempted to remove all sources of re-infection. Our knowledge of how to drain all the sinuses, of the menace of pyogenic foci in adult tonsils and the alveolar process, is too recent to enable us to tabulate a long series of *chronic cases* successfully treated. The improvement is necessarily slow and extends over considerable time. With energetic early treatment there is a more hopeful outlook for this field of otology.

As a line of investigation to be further developed, the writer sees no reason why such active foci as are constantly found in the teeth, tonsils and sinuses, should not contain bacteria with selective characteristics, *i. e.*, in some we would have our pathology in the mucous membrane, in others the connective tissue, and in still others the osseous structure.

CASE HISTORIES.

Case 1. Dec. 2, 1911. J. F. W., born in N. H.; age 51 years; single; provision broker; focus of infection, sinuses. *P. H.* Measles at 21 years of age. Rheumatism three years ago. Tobacco moderately, no alcohol. Neisser infection. Repeated head colds. Teeth all removed. General health good, except for history of gall stones. *Hearing.* Not normal for ten years. Worse for past 18 months. Sounds confusing. Sharp pain in both ears. Tinnitus. No history of aural discharge. Acute infections start in the head. *Exam.* B. m. t. thickened. Light reflex gone, retracted. B. nares, pus in middle fossae. Adenoid tissue central in the vault. R.-R.-fossa obstructed. B. Eustachian tubes open, the right being more open than the left. *Diagnosis.* B. o. m. sec. ch. B. sup. ethmoiditis. Repeated reinfections from a pyogenic focus in the ethmoid sinuses. *Treatment.* Exenteration of both ethmoid labyrinths. Argyrol, 20 per cent. to Eustachian tube. Inferior turbinates trimmed. Nasopharynx cleansed with normal salt and sprayed with argyrol, 20 per cent., until infection cleared up. *No inflation* except for diagnosis.

Hearing tests:

Dec. 2, 1911.

R		L
2/25	W	16/25
2/35	acu.	9/35
30″/10″	R	35″/13″
	W	
32	D	32
	(L. L.)	

March 15, 1913.

R		L
15/25	W	17/25
32	D	32
	(L. L.)	

March 13, 1915.

R		L
12/25	W	N
30″/10″	R	35″/13″
	W	
32	D	32
	(L. L.)	

May 13, 1916.

R		L
N	W	N
32	D	32
	(L. L.)	

Jan. 20, 1917.

R		L
N	W	N
35″/10″	R	45″/10″
	W	
32	D	32
	(L. L.)	

Result. No colds for a year; no tinnitus; hearing normal.

Case 2. May 20, 1915. Mrs. H., born in R. I.; age 59 years; married; no children; focus of infection, tonsil. *P. H.* Scarlet fever and typhoid at 29 years of age. Pneumonia 18 months ago. La grippe several times, but not severely until 1915. Tonsillitis annually for several years. Acute infections start in the throat. No aural history until five years ago, when the hearing became impaired, beginning in the right ear. Occasional tinnitus. No climatic variations. Slight catarrh. Pyrosis. Ears worse after each throat irritation. Is below weight. Nose red, color poor, and has been a semi-invalid for 20 years. Never rugged. Prominent otologist told her that nothing could be done, and instructed her maid how to inflate the ears daily. *Examination.* M. t. b. show ground glass appearance, dull, lusterless. L. nares, ant. deviation of septum so that an applicator cannot be passed. Contact with inferior turbinate. M. M. not injected, and no infection present. Septum, sigmoid deflection. *Sinuses* transilluminate normally, epipharynx negative. Pharynx, low grade pharyngitis. Tonsils, cryptic tonsillar disease. R free pus (one or two drops). *Diagnosis.* B. o. m. sec. ch. Cryptic tonsillar disease. L. ant. deviation of septum. Progressive deafness secondary to tonsillar infection. *Treatment.* Removal of tonsils, and after treatment until infection was gone. June 2, operation, Des Brisay Hospital. Complete tonsil enucleation.

Hearing tests:

May 20, 1915.

R		L
6/25	W	6/25
20″/10″	R	32″/15″
	512 F	
	W	
32	D	32

Oct. 18, 1915.

R		L
4/25	W	20/25
20″/7″	R	25″/11″
32	D	32

Dec. 10, 1915.

R		L
9/25	W	20/25
30″/15″	R	22″/12″
32	D	32

Jan. 11, 1916.

R		L
10/25	W	N
32	D	32

Result. Pyrosis gone, weight increased. The right ear, which was the first involved, gained 4 feet The left is normal. *No inflation.*

Case 3. June 4, 1916. Mrs. A. L. M., born in Massachusetts; age 66 years; widow; focus of infection, tonsils. *P. H.* No history, aural discharge or otalgia in early life. Hearing has been growing worse for ten years. *F. H.* Patient has two children living. Husband died 21 years ago, cause unknown (suicide). One brother and one sister living and in good health. No family history of deafness. F. died age of 60, cause unknown. M. died age of 80, cause unknown. *P. I.* Patient has had some ear trouble for the past ten years, which has been getting slowly worse. Hearing varies and is worse when she is tired or has a cold. History of head colds and sore throats once or twice a year. Ringing tinnitus occasionally. Sensation of stopping of ears. History of rheumatism. Left hand shows swollen joint. Used to wake with a headache. Left tonsil shows cryptic disease. Pulsation in ears since sickness three years ago. *Examination.* B. o. m. sec. ch. *A. D.* M. T. indrawn and dull. *L. R.* gone, no marked thickening. *A. S.* M. T. indrawn and lusterless. *L. R.* gone. Both tubes open, but the right a little the more. Isthmus not narrowed. *Treatment.* L. tonsillar infection cured by operation. No inflation at any time except for diagnosis. Local applications to tubes. Multiple and slow sinusoidal currents used for five minutes in each ear weekly. Current caused vertigo and nausea at first.

Hearing tests:

June 4, 1916.

R		L
1/25	Whisp.	2/25
10″/7″	R	10″/5″
	256 c	
——	Weber	——
64	L. L.	64
1/10th	U. L.	N

Dec. 15, 1916.

R		L
3/25	Whisp.	3 1/2/25

FEB. 8, 1917.			APRIL 2, 1917.		
R		L	R		L
8/25	Whisp.	8/25	10/25	Whisp.	9/25
N	U. L.	N	13″/7″	R	13″/6″
32	L. L.	32		Weber	
			N	U. L.	N
			32	L. L.	32

Result. Patient was gaining the most when she stopped treatment on account of the difficulty of coming into town at her age.

CONCLUSIONS.

1. Every case of chronic progressive middle ear deafness has a primary focus, which persists as a low-grade infection, subject to acute exacerbations. In chronic cases such foci are usually multiple.

2. Such primary focus is usually constant for the individual, and is indicated by the location of exacerbations.

3. Every case showing variable hearing can usually be improved up to their best hearing, or more.

4. So-called cases of nerve deafness of non-specific origin are in the experience of the writer due to toxemia from some definite focus.

5. Inflation in *chronic cases* is unscientific and harmful as a routine, as the tube is already open and has partly lost its tone in the majority of cases; and in those cases not open, it does nothing to remove the cause.

6. Nasal obstructions do no harm to the middle ear unless infection is present. Such obstructions, however, are the primary cause in the development of imperfect drainage, which predisposes to infection, and which is always present in cases of chronic secretory otitis media originating in the nose.

7. Foci, whether in the sinuses, tonsils, mandible or epipharynx, are potential factors in the progress of chronic progressive otitis media, either by direct extension or through the lymph and blood streams.

8. No hearing test will forecast the improvement in a given case as long as we have a positive Rinné with variable hearing.

9. Whatever the macroscopic appearance of the membrana tympani, the cause of the deafness is active for a long time outside the middle ear as a toxemia, or low-grade infection subject to acute exacerbations.

10. Constitutional diseases have but little effect upon the course of chronic secretory otitis media, except to lower the patient's resistance and make him more susceptible to exacerbations of his localized focus or foci.

THE ETIOLOGY OF DISTURBANCES OF THE HEART BEAT.*

BY GEORGE EDWARD BARNES, B.A., M.D.,
HERKIMER, N. Y.

IN attempting to solve the enigmas of disturbances of the heart beat I recognize the great difficulty and the uniqueness of the task. I trust and believe that I have ideas which will add to our understanding of these puzzling ailments.

Each student of this subject may choose between the neurogenic and the myogenic theory of the cardiac activity. I am quite well convinced that the neurogenic theory is correct, because within the last decade histological study has revealed minute ganglia in parts of the heart formerly supposed to be without them, particularly the apex, because certain forms of cardiac activity can be best explained on this theory, and because the intestine, which is an analogous structure, acts more obviously according to the neurogenic theory. If a ball of some smooth substance is placed in the lumen of a segment of gut removed from the body, a peristaltic wave will arise behind the ball and will propel it through the entire segment and expel it. But if the intrinsic ganglia in the plexus of Auerbach are removed, the segment of intestine remains motionless. If you adhere to the myogenic theory you should, in reading the following discussion, substitute in your mind the muscular tissue for the intrinsic ganglia.

Some specialists on heart diseases are inclined to think that disturbances of the heart beat are due in some unexplained way to disorders of the nervous system; most believe that they are due to muscular tissue disease, there being or having been a rheumatic or other infection; others believe that they are due primarily to diseased muscular tissue, but admit that emotion and exercise seem in some way to precipitate attacks. All admit that these disturbances of the heart beat occur frequently when no disease of the muscle can be discovered by gross or microscopic examination. I believe that the usual fundamental etiological factor in disturbances of the heart beat is a more or less neurasthenic condition, usually the sthenic form, and what I may call the sthenic rebound or recovery from the asthenic form, there being present a disturbed and unbalanced activity of ganglionic cells.

The theory which is, perhaps, most readily formed, on the neurogenic hypothesis, to account for disturbances of accelerated heart beat, is that somewhere in the course of the cerebro-cardiac path of the "sympathetic" or thoracico-lumbar innervation there takes place a stimulation which accelerates the heart beat. This reaction does take place when certain more or less violent affective currents pass from the brain and cause increase in rapidity and force of heart beat. Indeed, this phenomenon in a mild form is very frequent and in more extreme form is seen occasionally, especially during recovery from nervous prostration. But this simple tachycardia has well-known differentiation from paroxysmal tachycardia and, moreover, paroxysmal tachycardia or any other form of the more recently discovered disturbances of the heart beat cannot be caused by section of the vagi and stimulation of the accelerators.

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* Read before the Medical Society of the County of Herkimer, at Herkimer, N. Y., June [illegible], 1917. This article should be read as a sequel to the article entitled "The Rationale of Neurasthenia and of Disturbances of Arterial Tension," which appeared in this JOURNAL, Oct. 18, 1917.

On the other hand, there is evidence in some of these disturbances, particularly in case of diminished rate, of excessive vagal activity. In asthenic neurasthenia the radiation of pathetic affectivity to the heart takes place over the vagus nerve, and the rate of the heart beat is slowed. This is a very frequent phenomenon, an important fact which seems to be essentially unknown in clinical medicine.

It is generally agreed that sinus arrhythmia is due to increase of vagal tone, and it is stated that it is due to nothing else. If you look into the matter carefully I do not think you will consider that I am "splitting hairs" in saying that it is more properly due to the excess of vagal tone over the tone of the accelerator system. There is good clinical reason for believing that there is maintained over the heart, even necessarily, a constant tonal activity in both of these systems of nerves; and the physiologist Luciani expresses the opinion that there is this constant dual control. During vigorous exercise, as in athletes, children and, especially, in puppies, while affectivity is stimulating the rate of the heart, there is little doubt that there is taking place also an increased vagal tone to regulate the cardiac rhythm. But the vagal tone tends sometimes to continue more or less continuously or intermittently for a variable period after the cessation of the acceleration. In other words, in many of these cases of sinus arrhythmia, if the accelerators were not first brought into action by violent affectivity there would not be any subsequent excessive vagal tone. After the subsidence of the acceleration of the heart during fever, this same phenomenon is sometimes observed. This excess of vagal over accelerator tone also occurs in certain purely affective conditions, that is, apart from exercise or fever, as at puberty, and when the heart has been weakened by strong pathetic affectivity, the stimulation of the vagus in this instance, of course, being primary.

Extrasystole or premature contraction is certainly a complex problem. It is generally agreed that the impulse which causes an extrasystole originates at some point other than the sino-auricular node, and that the cardiac tissue at this point is unusually excitable. Most students of this subject hold that this unusually excitable point is in the muscle. Perhaps it is, but much more probably it is in the ganglia. Now what causes the irritability and the stimulation of this point, of this ganglion cell? Is it the stimulating effect of an impulse from the accelerator, the "sympathetic" or thoracic nerves? Although there is distinct evidence in many cases in which extrasystole occurs that the thoracic division of the nervous system is unusually active, it is hardly probable that this is, at least alone, the cause of extrasystole, for when the heart rate is accelerated through the thoracic division extrasystoles usually cease. Can the stimulating impulse come from the vagus nerve? There is abundant evidence of marked vagal activity in most cases of extrasystole, but how can inhibitory and diastolic impulses directly cause a contraction, an extrasystolic contraction, of the heart? Of course they cannot. However, we must not slight the fact that in nearly all cases there is good evidence of excessive vagal activity, and in many cases positive evidence that an increase of vagal activity, as in "pathetic" emotions or unmistakable vagal reflexes from the viscera, immediately precede the extrasystole. Among the many forms of vagal activity which may be present is one which I have not seen mentioned in this connection, and it should be both mentioned and emphasized, for it is of frequent occurrence. It arises thus: during exertion or during a certain "violent" emotion a violent affective current passes over the thoracico-lumbar fibers and, by causing an increase in the tone of the cardiac and arterial musculature, raises the blood pressure, which, in turn, stimulates the vagus centers. This reflex mechanism is recognized by physiology.

I suggest the following solution of the problem as to the causation of extrasystole. An impulse from the vagus causes a relaxation of the wall of the heart, and this very relaxation of the muscle fibers stimulates, by pulling on it, an excitable ganglion cell so that it starts an impulse which inaugurates an extrasystole. This hypothesis is all the more probable when there is—as there presumably often is—a hypertonicity of the whole heart due to marked activity of the "sympathetic" or thoracic system. It is shown by physiological experimentation that stimulation of the vagus acts often on one part of the heart more than on another part, acting, for instance, sometimes most on the ventricles and sometimes most on the auricles. Now if the heart muscle is in a state of marked tonicity, or even if it is only normally tonic, or even if it is already somewhat dilated, it is quite conceivable that when a vagal relaxing current passes into the muscle this muscle may not relax equally at all points, but may relax in a more or less uneven and zigzag manner, which would easily stimulate an irritable ganglion situated on the border between the slowly and the more actively relaxing tissues. The sensations of patients are very suggestive. When an extrasystole occurs there is a sensation of void or emptiness around the heart and in the throat. Now, some neurasthenic patients who are subject to extrasystoles often experience constantly for varying periods this same kind of sensation of void, and during these periods they experience the greatest number of extrasystoles. This sensation of void, whether very marked and appearing with an extrasystole or whether more vague and appearing continuously for a varying period, is doubtless caused by cardiac relaxation which is brought about by vagal currents, either reflex or direct from the brain, that is, affective. The theory which I present is not so complex as it would at first seem to be, and it explains in a definite and obvious way just how an abnormal point may originate an impulse before the sino-auricular node does, which, so far as I know, other suggestions do not do.

Mackenzie says: "If from any cause some other part of the heart becomes more excitable, in such a manner that it can produce this stimulus for contraction more rapidly than the sino-auricular node, then the contractions will start there and produce occasional beats as in extrasystoles. . . or if the sino-auricular node itself becomes too slow in its stimulus production, then some other part of the heart may start off before it, as in extrasystole." Here are two statements. The first one avoids entirely making any suggestion as to the cause of the starting of the abnormal impulse, for it says, "If from *any cause*. . . ." If Mackenzie had any real suggestion in his mind he did not mention it. The second statement does contain the suggestion that because of the slowness of activity of the sino-auricular node some other part of the heart may start the impulse. This is certainly one thing to be thought of, but there seem to be three important objections to it. In the first place, if this is all there is to the matter, would not an extrasystole be apt to occur every time the speed of the sino-auricular node slows to a certain degree? Such a uniform event would be expected according to such a theory unless it is supposed that the excitability of the abnormal center fluctuates from time to time, but such fluctuation would not be so apt to occur if, as he supposes, the phenomenon depends primarily on diseased muscular tissue or fibrosis. In the second place, some extrasystoles occur so quickly after a regular contraction that it would hardly seem as if during that minute period any point of the heart would develop an independent impulse (without being in some way stimulated). But if it can thus spontaneously develop an independent impulse, it was manifestly during that development not under the control of the vagus nerve; and if it was not under the control of the vagus preceding the maturation of the impulse, why, after it has once broken from the control of the vagus, does it immediately return to the control of the vagus instead of continuing to produce abnormal impulses and beats in accordance with its already spontaneously initiated abnormal activity? In the third place, extrasystoles sometimes occur when the rate of heart beat is rapid. So far as I know, Lewis offers no real explanation for the initiation of abnormal impulses.

The more often an extrasystole is formed, the more easily the abnormal activity takes place. A veritable habit is formed. The condition should be remedied before a habit is formed. I believe the heart should be rested so far as necessary and treated until extrasystoles cease.

Extrasystole rests on a neurasthenic basis. The neurasthenic condition causes the unusual irritability of the cardiac ganglia and the disturbing currents of both the thoracic and vagal nerves.

In paroxysmal tachycardia (that is, "simple paroxysmal tachycardia"), as in extrasystole, there is evidence, just before the attack, of the same or similar affective disturbances and neurasthenia, there is evidence of the same excessive activity of the thoracic and vagal currents, the same arterial contraction and the same irritability of ganglion cells, and there is probably more often a rise of blood pressure. I suggest the same method of origin for the initial pathological impulse. But in paroxysmal tachycardia the irritability of the stimulated ganglion cell or cells is so great that the abnormal contractions are continued for a longer or shorter time. There is a universal tendency in the whole autonomic nervous system for the lower ganglionic centers to continue the activity of the higher centers when the latter are cut off, and this fact and the great irritability of the ganglia account for the continuance of the pathological impulse of paroxysmal tachycardia after it has been aroused, as above suggested. In extrasystole the pathological activity is momentary because the abnormally irritable ganglion has only moderately excessive irritability, and the validity of the suggestion which I make is both possible and sufficient; but in the case of paroxysmal tachycardia, while the validity of the suggestion is possible, the question arises whether it is sufficient. It is easily sufficient, for the control of the vagus over the cardiac activity has marked limitations. Irritable cardiac ganglia certainly sometimes break away from the vagus control, especially during cardiac dilatation, and start a rhythm varying with the irritability. It seems as if some stimulation such as I have suggested is necessary to start the abnormally situated and acting impulse. The abrupt onset indicates that some stimulus starts the abnormal impulse.

Heart block, although frequently due, especially the complete form, to organic disease in the auriculo-ventricular bundle, is sometimes undoubtedly caused by increased vagal activity originating anywhere in the cerebro-cardiac path.

The same affective and ganglionic disturbances are present in auricular flutter and auricular fibrillation which are present in extrasystole and paroxysmal tachycardia, and there is reason to think that the abnormal impulses have the same origin and nature in the two former diseases as in the two latter. Flutter is apparently paroxysmal tachycardia in which the origin and passage of impulses is so rapid that they cannot all get through the auriculo-ventricular bundle; that is, they are blocked. Fibrillation can be produced from flutter by experimental and by therapeutic means, and apparently it is flutter in which abnormal impulses are formed at multiple points on account of the great irritability of many ganglia. (Cardiac muscle cannot be tetanized.) The presence of mitral stenosis in some cases of fibrillation merely serves to dam back the blood, the pressure of which increases the irritability of, and helps to stimulate, the ganglia. Mitral stenosis is not a prerequisite to the occurrence of fibrillation but, naturally, sometimes helps to precipitate it.

From sinus arrhythmia through extrasystole, paroxysmal tachycardia, auricular flutter to auricular fibrillation, there is to be observed a progressive increase in the irritability of the ganglia.

Mackenzie and Lewis do not make, and apparently do not claim to make, any suggestion as to the immediate cause of the initiation of the pathological beat. In fact, they apparently do not even raise the question. However, there seems to be a real problem here of great importance. If my suggestions stimulate the study of the question, they will not have been made in vain.

As to the nature of alternation, the disturbance seems to me to indicate exhausted ganglion cells rather than exhausted muscle, although the two, doubtless, often exist together. In this disturbance it would seem that the heart rests well only during every other diastole and contracts well only after the good rest, but contracts less well after the poor rest. It reminds me strongly of a very weak, neurasthenic patient who can rest well only every other night, and feels active only on the day following the good rest.

In disturbances of the heart beat one can always find evidences of other affective diseases, of other forms of neurasthenia. This is a most important thing. The ganglion cells of the heart and the whole vagal and "sympathetic" or thoracico-lumbar divisions of the great autonomic nervous system have been rendered irritable and hyper-active by the affective disturbances. As the heart disturbance has been brought about primarily by the neurasthenia and also, secondarily, by the state of the arteries, the treatment of the disturbance of the heart must include the treatment of the neurasthenia and the arterial condition. The whole matter is full of circles with which one should be familiar. A most important matter in the treatment of any of these heart disturbances is that all of them should receive treatment early, before the disturbance becomes a habit, and also before the kidneys (if they are endangered) have become damaged. Neurasthenia, affective disease, is at the bottom of prevalent and increasing cardio-vascular-renal disease, and there is no doubt about it.

Just what is the relation of infections and their fibrotic consequences to disturbances of the heart beat? It is easy to say that a rheumatic or other infection is the cause of a disturbance when such an infection is present, or was recently present, or was remotely present, and it is easy to elicit an erroneous history of previous rheumatism. (It is equally easy to say that syphilis is the cause of every disease of which we do not know the cause.) I believe that these disturbances of heart beat exist far most frequently in hearts in which there is no trace of damage done by rheumatic or other infections. The one disease in which evidence of former damage by rheumatic infection is frequently observable is auricular fibrillation, and in this disease, as I have already said, the accumulated dammed-back blood acts, as would be expected according to physiological experiments, to stimulate the activity of the heart chamber, which is, in case of fibrillation, predisposed to fibrillate on account of the condition of its ganglia. Even Lewis, who believes that disease of the muscle is at the bottom of disturbances of the heart beat, says, in regard to auricular fibrillation, immediately after mentioning the chronic inflammatory fibrotic changes found by microscopic examination: "Such is the tale told by the microscope, but it does not justify us in holding that the inflammatory reaction is the cause of the altered mechanism. . . Similar lesions are found where fibrillation has never occurred; and hearts which show this disorder may not present the lesions described." That sounds correct and it is correct. However, as the pressure of the dammed-back blood in mitral stenosis serves to stimulate the chamber in predisposed cases, it may be regarded as a contributory or exciting cause only. A similar conclusion may be reached in regard to any of the disturbances of the heart beat which appear during or just after infectious fevers. As a matter of fact, these disturbances appear more frequently just after the course of the fever than during it. This would not be apt to be so if the disorder were caused by the infection itself or its toxins, and it indicates that the disorder is precipitated during the reaction of the nervous system against the effects which have been produced by the infection and its toxins. The occurrence of a disturbance of the heart beat just after or even during a fever is good indication that the nervous system and the heart are predisposed to the disturbances of the beat. In a somewhat similar way, mental delirium is connected with fever in some cases only.

The microscopic anatomy of the heart in the disorders of the beat probably needs to be gone over again, and it is certain that the findings need to be interpreted with a broader knowledge of the clinical disturbances which affect the heart muscle and ganglia. Neurasthenic disturbances in the circulation affect the metabolic and anatomical condition of every tissue in the body, the heart included; and neurasthenia, aside from being a most important and prevalent multiform entity, often complicates any other ailment to which flesh is heir.

The ideas in this paper I am glad to add as my bit to the great work done by the masters on heart diseases.

Clinical Department.

A CASE OF BRAIN TUMOR SHOWING EXTENSIVE DESTRUCTION, WITH FEW DIAGNOSTIC SYMPTOMS.

By Herbert E. Thompson, M.D., Worcester, Mass.,
Pathologist at Worcester State Hospital.

The following case of brain tumor shows several points of interest which make it worthy of being reported.

This case is that of a man dying at the Worcester State Hospital at the age of seventy. The case record shows the following:

Family history negative. He was a native of Massachusetts, married, and a painter by occupation; meagre education. He supported himself since eight years of age. Most of his life he was a house painter, but for the past ten years has painted machines in a machine shop. He always drank whiskey and beer to some extent, but always tried to provide well for his family; was always irritable when drinking, but quiet when not drinking.

The beginning of his psychosis is said to date back three years, when he would wander away from home. For a year before admission, his employment was unsteady and he was irritable all of the time. At one time he is said to have told his wife to keep away from him as he might harm her. He developed a tendency to lie in bed much of the time, but would often get up at night and go about the house to see if there were any intruders. He is described as having a few attacks in which he would become pale, rigid and confused. After these he would sleep for a long time. No convulsions, however, are mentioned. Untidiness in his personal habits became especially noticeable. Four days before admission to the hospital he wandered away from home and was arrested for vagrancy.

When admitted to the hospital he was quiet. He appeared somewhat confused and seemed to know nothing about his recent arrest. His gross memory defect was marked and he tried to remedy it by fabrications. His answers to questions were, for the most part, relevant, but incorrect.

The physical examination showed very little of diagnostic value. He was well developed, but somewhat poorly nourished. He complained of no abnormal sensations. His face muscles were symmetrical. His pupils were equal, regular, and reacted to light and accommodation. Marked dermographia. His gait was normal, but he swayed slightly in Romberg. Hand grips weak, but equal. No clonus and no Babinski. The radial arteries were thickened and tortuous. He showed a systolic blood pressure of 184. Wassermann reaction on blood serum negative.

During his residence here his condition gradually became worse. His mental confusion became more marked. He was confined entirely to his bed and was very untidy, apparently having no control of his sphincters, and it was necessary for him to be spoon fed. He developed bronchopneumonia and died after a residence of twenty days in the hospital. Diagnosis: Organic dementia, arteriosclerotic type.

Permission for autopsy was granted and performed on April 23, 1917. The post-mortem examination showed a well marked bronchopneumonia and a general sclerotic and calcareous condition of the vessels; otherwise the trunk organs showed nothing of importance.

The superficial examination of the brain showed the left cerebral hemisphere to be much larger than the right. The convolutions on this side were very much flattened and had the appearance of being pressed out by some internal pressure. Palpation over the left frontal lobe revealed an area of fluctuation. The brain was placed in formalin and allowed to harden.

After hardening, the following points were noted:

The inequality of the two hemispheres, with a broadening of the convolutions on the left side, as mentioned above. This is shown in figures 1 and 2.

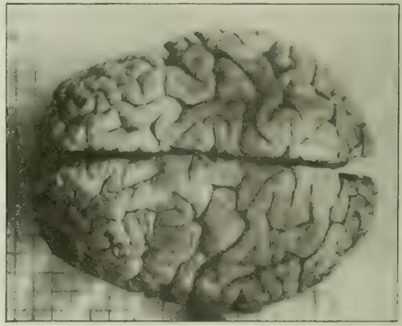

Fig. 1. Showing inequality of hemispheres. Superior view.

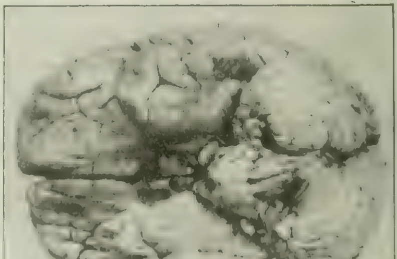

Fig. 2. Showing inferior surface.

Separation of the frontal portion of the hemispheres showed a bulging of the left first frontal convolution and gyrus fornicatus, causing a corresponding depression on the opposite side. The left cerebellar hemisphere is slightly smaller than the right. Separation of the two hemispheres by longitudinal section showed a well-marked tumor, the cut surface of which was 3 cm. in diameter, occupying the anterior portion of the corpus callosum. (Figure 3.) The tumor was soft and grayish-red in color. Portions were so soft that it was difficult to handle without breaking. Transverse sections of the brain showed that the tumor mass was almost entirely in the left hemisphere, involving the entire white matter of the left frontal lobe. The right frontal lobe was involved only to a slight extent. The left lenticular nucleus and caudate nucleus were extensively involved, also the internal capsule. The firmest part of the tumor was the mesial portion, cut through in separating the hemisphere. The main mass was jelly-like in consistency. (Figure 4.)

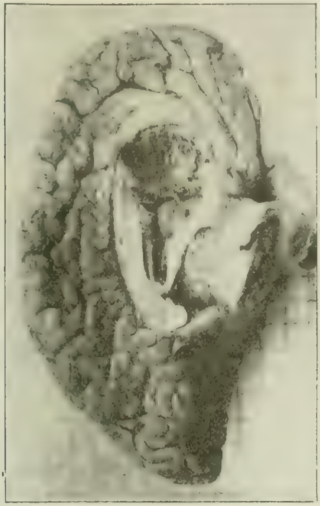

Fig. 3. Mesial surface of the left hemisphere, showing tumor in corpus callosum.

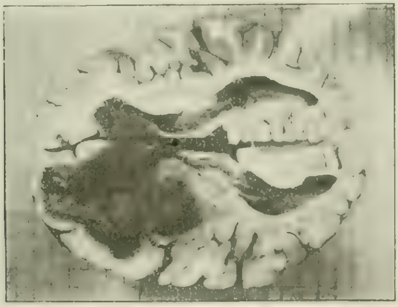

Fig. 4. Showing extensive destruction of left hemisphere.

Microscopic examination of sections stained with Mallory's neuroglia stain showed that the tumor was composed of cells and neuroglia fibrils and was very rich in blood vessels. The walls of the blood vessels were poorly formed and many of the vessels contained thrombi. In many places there were quite large collections of red blood corpuscles lying outside the vessels. Tumor cells were shown throughout. A few areas showed both cells and neuroglia fibrils. The cells were both round and spindle shaped, many of them being very long and narrow. (Figures 5 and 6.) It appears, from the character of the cells and neuroglia fibrils, to be a glioma. The extent to which it destroyed the cerebral tissue was very striking.

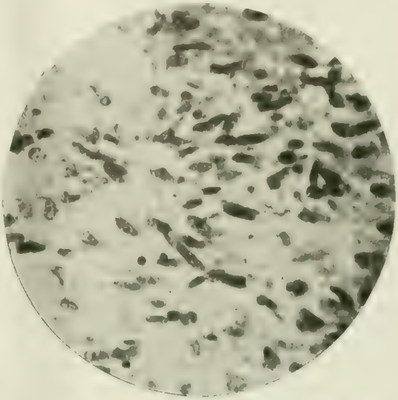

Fig. 5. Showing tumor cells. Mallory's neuroglia stain.

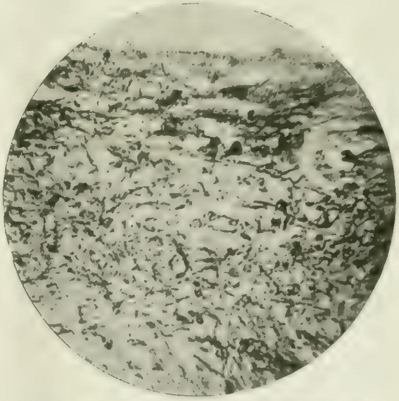

Fig. 6. Showing fibers. Mallory's neuroglia stain.

Starr points out that extensive tumors may exist with few diagnostic symptoms and mentions one case of an extensive glioma of the frontal lobe of left side diagnosed, on account of convulsive seizures, as a case of epilepsy.

This case also presented attacks which might be considered epileptiform in nature; however, no convulsive movements were noted.

Cushing mentions loss of control of the sphincters in connection with tumors of the corpus callosum. This symptom was noticed very early in the present case. The main features of the case, however, appear to be gradual progressing physical weakness and mental confusion. These symptoms, together with the high blood pressure and palpable radial arteries, point to a diagnosis of arteriosclerotic insanity.

To summarize: we have a glioma of the brain causing extensive destruction of the brain tissue. It involves the corpus callosum, white matter of the left frontal lobe, caudate and lenticular nuclei and internal capsule. The mental symptoms have showed themselves by a tendency to wander about, increased irritableness and loss of memory. An early symptom was the loss of control of the sphincters. The history is one of occasional seizures, characterized by pallor, rigidity and confusion, followed by prolonged sleep. As the disease progressed, memory loss and confusion increased. Twenty days before his death he was able to walk with a normal gait, and hand grips, although weak, were equal. Pupils reacted normally and tendon reflexes showed nothing unusual. Eye grounds were not examined. As his mental confusion progressed it became necessary to keep him in bed and feed him with a spoon, but no paralysis of either upper or lower extremities is noted, neither were any speech difficulties mentioned. Headache is nowhere mentioned in the case, either before or after admission to the hospital.

The case seems interesting on account of the poverty of diagnostic features as compared with the extensive destruction of brain tissue.

BIBLIOGRAPHY.

Mallory: Journal of Medical Research, Vol. xiii, No. 2; Principles of Pathologic Histology.
Tooth: Brain, Vol. xxxv, Part 2.
Starr: Nervous Diseases, Organic and Functional.
Cushing: Modern Medicine, Vol. v.

HEMORRHAGE FOLLOWING TONSILLECTOMY.

By H. H. Amsden, M.D., Concord, N. H.

Paul D., age 9 years, was admitted to the Margaret Pillsbury General Hospital on Saturday, August 4th, at 9 p. m., with the following history: Tonsillectomy had been done in a Boston clinic on Monday, July 30th, and he had returned home the next day, and had apparently been all right until Saturday, when he began to bleed freely. Inspection of the throat, under ether, showed a large buttonhole of the right anterior pillar, from the upper angle of which the bleeding occurred, which was easily controlled by a catgut stitch. There was considerable shock, necessitating subcutaneous infusion of 500 c.c. salt solution.

The late occurrence of the hemorrhage was evidently due to contraction of the tissues in healing, thus allowing the upper angle of the wound to open. The case suggests the advisability of immediate repair of such injuries of the throat incident to tonsillectomy.

Book Reviews.

A Text-Book of Practical Therapeutics. With Especial Reference to the Application of Remedial Measures to Disease and Their Employment Upon a Rational Basis. By Hobart Amory Hare, M.D., B.Sc., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; One-time Clinical Professor of Diseases of Children in the University of Pennsylvania. Sixteenth edition, enlarged, thoroughly revised, and largely re-written. Illustrated with 149 engravings and 7 plates. Philadelphia and New York: Lea & Febiger. 1916.

The mere fact that this work has appeared in its sixteenth edition would seem to prove that is was necessary to the medical profession, but still as one persues it, one can but realize that it is more or less a monument erected to past practices and therapeusis, of which we are now happily largely free. Simplicity is certainly not one of its characteristics, when twenty different varieties of iron are listed and described and that acme of shot-gun prescriptions, Warburg's tincture, is included.

On the whole, however, the scheme of arrangement is rather a good one. Beginning with general therapeutical considerations in which the general methods of absorption and action of drugs are considered, we have a description of the different pharmaceutical preparations and a discussion of the metric system in which an attempt is made to give corresponding measures in the old or apothecaries' table and in the newer one, the grams and cubic centimeters. Old customs and uses die hard and it would seem that soon, some one, as the pharmacopeia has already done, should "take the bull by the horns," and give us a work in which the metric system alone should be employed. Half of the difficulty which the younger generation have with this decimal system is due to the persistent efforts of authors to bridge the old and the new. This necessarily causes needless complications of fractions in dosage and entirely obliterates the simplicity of the newer system, which is its main recommendation. It would seem, too, that a lesson in Latin, such as ought to be acquired by every youth in the first year of his high school course, should not be necessarily included in a work of this character, when such efforts are being made for preliminary education of medical students.

The second part deals with drugs, of which an excellent description is given as well as their physiological action. Due weight is given to the therapeutic action of drugs and rather more emphasis than necessary is laid upon their application to control symptoms, without thorough knowledge of the underlying conditions which produce these symptoms. Many drugs, too, are retained, which have practically passed out of use by the majority of physicians. All of the newer, useful drugs are mentioned, and, as far as a cursory examination is concerned, none are included which would offend the rigid principles laid down by the American Medical Association council in chemistry.

The third part includes remedial measures other than drugs, and is the most valuable in the book, since these measures are, unfortunately, less understood by the profession at large than the uses of drugs, one of which is supposed to exist for every ill to which flesh is heir.

The author's emphatic stand on venesection is to be heartily commended, since many a young physician finds his hands tied when it comes to the employment of this measure, clearly indicated by the pathological condition before him, because of the fear that on account of its rare use his efforts will be misunderstood, not only by the patient's relatives and friends but also by other physicians. This section also includes an article on dietetics, unfortunately, only too brief.

The fourth part deals with the employment of drugs and other measures in specific diseases as well as to overcome certain symptoms. It seems unfortunate that a condition termed by the laity as "biliousness," should receive the careful consideration of the author because, as far as known, this condition has various pathologies or, as one might say, no pathology at all, and the propagation of such a term would seem to halt our progress toward a clear definition of disease. Dyspnea, too, is another condition which receives his careful attention, but as this is merely a symptom and may arise from conditions as varied as obesity and actual cardiac decompensation, it would hardly seem that physicians should be taught to treat it as an entity.

On the whole, until therapeutics are taught with the directness and simplicity which is presented in the small works issued by the American Medical Association, this book will probably prove as good as any to help the halting physician whose early instruction in therapeutics was woefully neglected.

The Pathology and Differential Diagnosis of Infectious Diseases of Animals. By Veranus Alva Moore, B.S., M.D., V.M.D. Fourth edition, revised and enlarged. New York: The Macmillan Company. 1916.

The importance of animal diseases in relation to those of human beings is not merely economic but clinical, and gives a genuine value for physicians to any work on veterinary medicine. This fourth edition of a standard textbook of animal diseases, appearing after an interval of eight years since the third, aims to provide for veterinary students and practitioners a systematic account of the common diseases coming within the category of their diagnosis and treatment. The text has been carefully revised, much of it rewritten and numerous additions made. Two appendices have been added, one on the requirements for interstate shipment of livestock and the other on federal regulations for the veterinary inspection of meat. The book is well illustrated with 120 figures in the text and contains one large folded chart insert. The references to literature are conveniently and alphabetically grouped at the close of the section dealing with each disease. It is a work cordially to be recommended for the perusal of all interested in animal diseases, either for their own sake or in their sanitary and economic relation.

Man, an Adaptive Mechanism. By George W. Crile, F.A.C.S. Edited by Annette B. Austin, A.B. New York: The MacMillan Company. 1916.

In the issue of the Journal for February 24, 1916 (Volume clxxiv, page 287), we reviewed Dr. Crile's monograph entitled "A Mechanistic View of War and Peace." This new volume by the same author may be regarded as an extension and continuation of the same subject, with which he has been dealing experimentally and clinically for a score of years. The main thesis of this new contribution is "that man is essentially an energy-transforming mechanism, obeying the laws of physics as do other mechanisms." His purpose in promulgating this thesis is to increase the scope of preventive medicine, to indicate means to relieve and even cure certain acute and chronic diseases, and to stimulate a biologic trend of thought in medicine to the end that disease, like health, may be given its evolutionary setting. After a brief introduction the work is divided into three parts, the first dealing briefly with the familiar and now well-recognized postulate of biologic adaptation and the ascent of man. The second part deals with the mechanisms of adaptation, which the author classifies as receptor and effector; and the third part deals with the biologic interpretation of the phenomena of health and disease from the mechanistic standpoint. In the development of his theory, it is interesting to note that he announces the substitution of the word "anociation" for his previous term "anoci-association." Like the preceding work this book touches closely on the mechanistic interpretation of the animate universe according to Loeb. It is admirably illustrated with a series of eighty-eight figures representing both macroscopic and microscopic phenomena of mechanical activation. Whatever its ultimate acceptance, the work is a genuine contribution to medical philosophy and as such deserves the attention of the profession.

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PROBLEMS OF TRENCH FEVER.

TRENCH FEVER, which is regarded by all who have seen it as an unwelcome remembrancer of filth and war, seems to be confined to the British troops in Flanders. It seems rather difficult to explain why, for the supposed carriers of the disease, lice, are, unfortunately, common in all climates and under all conditions of dirt and hardship. Results of bathing and clean clothes are often curative, or leading to cure, which is certainly significant. Some cases, it is reported, have occurred in other countries besides France and Flanders—in Mesopotamia, the Balkans and Salonica. Captain J. M. A. Costello, in a careful article in the *Practitioner* of May, 1917, questions this. He states that trench fever occurs in Flanders but not in England, and always among British troops. Surgeons of other nations have written little about it. Except a summary of the British reports in the *Policlinico*, and a brief description of what may be trench fever in the *Wiener klinische Wochenschrift*, we do not remember that we have seen any other descriptions at all resembling it.

The symptoms are so diversified that there is something ill-defined about the clinical picture. It bears a close resemblance to malarial fever. Quinine, however, seems to have no effect, and cases recover without medicine. The fever is described as recurrent, relapsing, or intermittent. It is so fugitive that, at first, trench fever was labelled "pyrexia of uncertain origin." It reminds English students of an older conception, "fever without physical signs." In fact, the possibility of fever without specific cause, in the circumstances of trench life, may well seem an open question. The chief thing is that the fever exists for two distinct periods, with a normal interval between them. The curve is said to be characteristic, but the published charts do not bear out this view. In some cases the temperature ranged from 99 to 102, in others from 103 to 104. Generally it is more like the pyrexia of influenza than any other, but Combes has observed a recurrent type, and many writers speak of remissions. All agree that the onset is extremely sudden.

There are a number of signs about this fever that experts have sought to differentiate in meaning. The season at which it occurs is one. Some writers state that most cases occur in winter, while others believe that the fever is an affair of spring and summer. Cold and wet have a great influence, but the most certain appears to be nervous strain, with constipation and lack of sleep. Overwork and anxiety are believed to provoke an attack. Other depressing influences—bad food, wet feet and wet clothes—are, doubtless, causes. An interesting phenomenon is much discussed, viz., that trench fever leaves very little weakness or physical prostration behind it. This is peculiar if the cause be, as seems likely, a blood parasite.

There is no doubt that the disease is infectious. It often happens that several men in a dug-out are taken at the same time, and contacts show the characteristic symptoms in thirty-six or forty-eight hours. The blood of patients, when injected intravenously, produces the fever in its regular form, the period of incubation being 15 days. Lice, as has been suggested, transmit the germ. In 1915 Major J. H. P. Grahame made the important discovery that a louse, a parasite of the Indian rat, was the host of the unknown protozoön. Lice were allowed to bite patients and then the healthy controls, in whom the typical manifestations shortly appeared. The experiment gives a clue to the nature of the specific organism. Similar observations have been made by Hurst, Hughes, McNee, and his colleagues. The etiology, if true, is also interesting as illustrating the main features of the disease—its suddenness, climatology, and periodicity.

The newest thing about trench fever is the study of the blood. Recently, Captain Lyn Dimond described in the *Lancet* a small hemogregarine resembling in many respects Hemogregarina gracilis, which he has found in the venous blood, the blood from the liver, spleen, and lung in 12 cases. It is present in small numbers a day or two before the fever. The blood was hemolyzed by the addition of saponin, and the parasites were seen moving in the centrifugalized deposit. He believes that the carrier of the protozoön is the louse of the Indian rat.

Diagnosis of trench fever is not especially difficult. The symptom by which it is usually disclosed is the "shin pain," a pain beginning in the external popliteal nerve and extending to the tibia. There are pains in the leg above, in the neck, and sometimes stiffness of the neck. It is easy to mistake trench fever for meningitis, influenza, and rheumatism, but the mistake is also one which ought to be easy to correct. As the disease is not fatal, nor even particularly disabling, it is always possible to wait and see. The question arises, after all: is it a new disease, or the rediscovery of an old one? As the paramount view of its cause is protozoal, like malaria, it seems fairly certain that the war has evolved a new form of morbidity. Most surgeons define it as a trench pyrexia, though some think the term a misnomer. The treatment is of the simplest kind—a blue pill and sodium salicylate, and, obviously, prevention lies in cleanliness.

THE CORRECTION OF VISUAL DEFECTS.

The normal eye and normally acute vision are matters entirely relative, depending upon a variety of extrinsic circumstances. But they depend particularly upon the ability of the individual to make the most accurate interpretation of his visual perceptions, and the use to which the eyes are put. The standard of normally acute vision, 20/20, is an arbitrary one. To be sure, most eyes conform to this standard, but there are normal eyes that focus parallel rays at greater distances, or at lesser ones. The increase in the use of lenses among the civilized peoples is no indication that civilization is accompanied by an increase in the amount of visual defects. It indicates, rather, that the more refined use of the eyes, in keeping with modern progress, necessitates commensurate visual aids. The usual visual requirements of the aboriginal races or of the cruder people do not require the aid of lenses with even relatively higher visual defects. The notion that aboriginal races have more acute vision than the civilized ones is not founded on fact. In their own environment and for their own necessities, they have learned to take advantage of every aid to their vision, usually by enlisting other senses and by learning to interpret their perceptions. On the contrary, the higher the development, the greater the need for good vision. As an illustration of the differences between the needs of the crude and the developed peoples in respect to vision, it must be remembered that the permissible limit of effective vision in the skilled worker ranges between .75 and .15. In the unskilled worker it ranges between .50 and .05. In other words, the skilled worker is practically blind when his vision falls to 1/7; the unskilled worker is practically blind only when his vision falls to 1/20. And yet the coarser the occupation the greater the distance of performance, but the less the visual acuity required in performance. All fine work, work requiring detail, is near work. It is in this work that refractive errors give the greatest trouble, and it is in this form of defect that the increasing amount of lense-wearing lies. This is undoubtedly the transitional stage, the metamorphosis from the crude requirements to the more refined, during which visual aids are required, at least until the physical visual development of the race has caught up with its mechanistic development. Aside from inability to do good work, with uncorrected refractive errors, the continual straining by the ocular muscles to get details into focus produces many physical but especially nervous disturbances. Except for the necessity of obtaining better vision for the better work done, there would be as little rise in the frequency of lense correction as among the less developed.

With the aid of various optical instruments—the ophthalmoscope, the retinoscope, the ophthalmometer, etc.—the objective examination of the eyes has been reduced to mathematical accuracy. Almost anyone, with the exception perhaps of one whose vision is grossly defective and uncorrectible, can become sufficiently familiar with these instruments to determine the exact optical or refractive error of a particular eye. It is in this ability to master the instrumental refraction of the eyes that the business of optometry has sprung up. It must be remembered, however, that with the eye, as elsewhere in the body, one does not deal with an isolated organ, nor with an inanimate mechanical contrivance, for which certain mechanical rules must be followed. In the correction of visual defects, the same understanding of the interrelation of all parts of the body, and the same use of judgment is required as in other pathological conditions. And it is, nevertheless, the general experience of oculists that those who need correction in order to do the most refined work, find their way to the oculist before long, if they have not done so at the beginning; and the work of the legitimate oculist is in no wise curtailed by the great number of optometrists.

While there are certain broad indications for the modification of the refractive findings, that apply everywhere, the refractive error of each individual must be corrected in accordance with his personal needs. In practice it is found that the result of the instrumental examination of the eye does not always coincide with the ability of the individual to accept such correction. Moreover, it is not always feasible to give a myope full correction, for fear that his myopia may be overestimated and a condition of pseudo-hyperopia be produced, with all its bad results; and the contrary is often true with the hyperope. The correction that gives the greatest degree of vision often causes a great deal of discomfort. As with all appliances, one must become accustomed to them before the greatest benefit accrues, and the highest speed or correction had best be postponed till such time. The highest degree of acuity must often be sacrificed for comfort. It is the purpose of correction to give the highest degree that the individual can accept, and not merely the mechanical neutralization of the optical apparatus.

In the last analysis no vision can be called defective unless it has been put to practical test and been found unable to do the work required of it. The visual concept depends for its completeness and accuracy on many extrinsic non-ocular precepts. As in other things, individuals must be trained to see—to get the most out of their visual capacity. Unless more vision is actually supplied without discomfort, or vision made more comfortable, a mere optical correction is valueless. A medical correction of the pathological cause and of the symptoms, rather than merely a mechanical neutralization of the optical error, such as the optometrists supply, is the aim of the scientific medical practitioner.

SEASONAL CATARRHS.

The colder seasons of the year are accompanied very often by three very common diseases, sometimes appearing in epidemic form of varying intensity,—influenza, pneumonia and cerebrospinal fever, besides the vague nasopharyngeal and respiratory conditions classed under the term, "common cold." Of the three diseases mentioned, all have certain features in common, which make their early differentiation less likely unless these similarities are borne in mind. They may all be of sudden onset; all locate the causative bacteria or agent in the nasopharynx; all are spread by droplet method of infection; and all have a "carrier" population of some magnitude, by which the condition is kept alive in a community, and whence epidemics originate. Of the three diseases, influenza is apparently the most common, although of the vaguest symptomatology. The bacteriological diagnosis of this disease is rarely made, probably because of the difficulty of isolating the bacillus of influenza, but particularly because the public does not consider the disease of sufficient importance or severity to warrant the effort in this regard. Severe attacks of influenza are usually considered complications rather than the expression of the disease itself. But influenza is important and serious, if for no other reason than that it is, perhaps, one of the largest factors in the spread of tuberculosis, either because the ever-present tubercle bacillus lives and develops better in symbiosis with the influenza bacillus, or because the general lowering of the vitality, the inordinate prostration, give the tubercle a better chance to develop.

While the bacteriology of all these diseases is fairly well established, it is rarely the subject of local investigation by the practitioner. A culture from the throat of every catarrhal case would very early serve to differentiate the conditions, prevent the development of the disease, its spread to others, and anticipate complications or sequelae. The development of the serum and vaccine treatments of pneumonia and cerebrospinal fever urges another reason for the early differentiation of the nature of the particular catarrhal fever under observation. It must be remembered that not every infection with the meningococcus or the pneumococcus presents classic symptoms or pathological lesions. Nor do all persons having or harboring these germs present symptoms at all. But all of those who harbor them can act as the foci for the spread of the particular infection. The bacteria of any one of these diseases may cause symptoms usually ascribed to another. In the case of influenza, pneumonia and the pneumonic symptoms may be caused entirely by the influenza bacillus, without the operation of the pneumococcus. And meningeal symptoms are not uncommon in pneumococcus pneumonia, while the early symptoms of a severe and classic case of cerebrospinal fever, or even the entire course of a mild case, may simulate the symptoms commonly ascribed to influenza. Yet a swab from the nasopharynx clears up any doubt. Moreover, the pneumococcus, the meningococcus or the influenza bacillus can all simulate any of the other diseases, but unless early recognized may spread severe epidemics of the distinct disease causing these interchangeable symptoms. In the last influenza epidemic, in which there was so high a degree of pneumonia, much of the influenza complex was not really caused by the influenza bacillus, but by the pneumococcus. In other words, the pneumococcus may give only influenzal symptoms, and not pneumonic at all. As a result, what is called an influenza epidemic is really a pneumonia epidemic. It was, likewise, the experience of many observers during an ascendency in the morbidity from cerebrospinal fever, that many cases of illness that had only a transient indisposition, perhaps only with mild catarrhal or "influenzal" symptoms, were infected with the meningococcus, and recovered without any of the serious classical symptoms of the disease. This was the experience in England among the troops billeted in many communities in the early part of the war, and before this circumstance was recognized. Cerebrospinal fever, early known as "troop disease," will present the same problem in our own troop mobilization unless the lesson of England is learned. The time must now be at hand when every catarrhal condition will demand a swab and culture, just as almost every tonsillar condition demands it in the interest of the prevention of the spread of diphtheria. During seasonal epidemics there is an especially great opportunity of studying the bacteriology of the conditions vaguely called influenza, of separating them etiologically, of detecting and isolating "carriers," of instituting sensible quarantine, and in a general but comprehensive manner, contributing to the cause of preventive medicine.

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RÔLE OF INTERNAL SECRETION IN DIGESTIVE CONDITIONS.

Recent experimental studies on the causation of gastric and duodenal ulcers have served to modify somewhat the theories previously held, namely, that gastric conditions could usually be traced entirely to intrinsic dietetic or digestive errors. While this is still true, the dynamic significance at least has been changed. The studies in internal secretion have uncovered a relation between the digestive tract and the endocrinous system. It is now found that disturbances in internal secretion, or rather in the function of the glands of internal secretion, adversely affect the vagus and the sympathetic, both of which are so largely concerned in the control of the digestive organs. Gastric and duodenal ulcers may be caused principally by disturbances in the thyroid and adrenal glands, and less directly by the disturbance of function of the other glands of this system. Gastric ulcer is usually associated with the adrenals, while duodenal ulcer is associated with the thyroid. The disturbance can be either an excess or deficiency of secretion. Extirpation experiments have produced, among other conditions, ulcers of the stomach or duodenum, according as one or the other of these glands was removed. It seems, moreover, that these two glands exercise an antagonistic control over each other in respect to the digestive apparatus over which they reign. Simultaneous overaction or underaction has no adverse effect, for there is in effect, then, a sort of neutralization of action. Only when one or the other is out of antagonistic control is there organic change. The uncontrolled overproduction of one of these glands acts as a toxin which, circulating in the blood, irritates the nervous centers controlling gastric and intestinal functions. Gastric ulcer is associated with irritation of the vagus, while duodenal ulcer is associated with the sympathetic. Furthermore, adrenal disturbance is associated with the gastro-vagus function; thyroid disturbance with duodenal-sympathetic function. Toxic irritation of the associated nerve centers causes spasm of the blood vessels and ischemia of the tissue supplied, and then ulceration. In other words, the disturbance in the production of internal secretion acts adversely on the vegetative balance and then on the tissues.

These effects may be paralleled experimentally by the injection into the circulation of such drugs as pilocarpin, muscarin, physostigmin, on the one hand, and atropin on the other. As a further illustration of the association of digestive conditions and the products of internal secretion, it is found that the blood pictures in hyperthyroidism and of adrenalin hyperfunctionation are the same as in duodenal and gastric ulcers respectively. In the one there is polyglobula and relative eosinopenia; in the other there is mononucleosis and relative eosinophilia. Similarly there is found a relation between the sugar percentage of the blood in gastric and in duodenal ulcers, and in the respectively associated gland disturbances.

The knowledge thus far gleaned in respect to the relationship between hormone and digestion hardly solves the problem of any but this particular disturbance. The surface merely has been scratched. While the large number of obscure digestive conditions may be similarly inclined in their causation, it remains for the laboratory man and the clinician to discover this trend, and place gastroenterology on a more scientific basis. Yet it would be unfortunate if, in the quest of such scientific bases, the fact that unhygienic living and high pressure were basic causes of most digestive conditions, were overlooked. These are the vices that are undoubtedly at the bottom of the initial gland disturbance and are the cause of the loss of the vegetative balance. Hygienic and medical treatment is still unreplaced in the rational treatment of such disturbances, although organotherapy has driven a wedge into them. Whether organotherapy is to become the main reliance in the treatment of these conditions, as well as the many for which this form of therapy is being urged, is too early to say, except that to the scientific mind in search of specific therapy this must appeal romantically.

CARDIOVASCULAR PARASYPHILITIC AFFECTIONS.

Such nervous diseases as tabes dorsalis and general paresis are now almost universally accepted as being entirely of syphilitic origin. Indeed, when parasyphilitic diseases are spoken of, the nervous diseases are understood to be meant. Yet the most important, and perhaps the most frequent of the parasyphilitic affections are overlooked when the cardiovascular late effects of syphilis, either primary or hereditary, are not included in this category. The great rise in the degenerative diseases in modern times—in arterial, valvular and myocardial diseases—as against the fall in other diseases as a result of the strides in preventive medicine, while due in part to alcohol and strenuous living, must be associated with the increase in syphilitic affections in civilized communities. There is, however, no recorded proof of this rise, although the impression is universal. In the case of syphilis, and other so-called venereal affections, the lack of recorded evidence is due to the still generally loose statistical methods obtaining in many communities, but particularly to the hesitancy of reporting these diseases to the health authorities because of the stigma attached to them. Moreover, there are late manifestations of these degenerative conditions in the progeny of syphilitics, where, of course, the etiology of the conditions is not easily traced to syphilitic ancestry, without the most searching inquiry.

In the young and in the middle-aged, the number of cases of arteriosclerosis and aortic disease not due to syphilis, direct or hereditary, is negligible. Aortic disease is a more specific manifestation of syphilis than the more general condition known as arteriosclerosis, and it may more truly be called a parasyphilitic disease. Mitral disease, on the other hand, is a specific affection of rheumatic origin. In aortic disease, the Wassermann test is usually positive. But whether positive or not, antisyphilitic treatment, combined with appropriate cardiac treatment, is always beneficial. Perhaps the periodic treatment of these affections with mercury, the iodides and salvarsan is as beneficial as the periodic treatment of mitral disease with alkalis and antirheumatics. It must be remembered, however, that while aortic and arteriosclerotic conditions in the young and in the middle-aged are associated with syphilis, the same significance cannot be applied to them when occurring in the aged. Neither the impression nor the treatment would be just to them. In the aged these conditions are due to senile degenerations, and treatment, therefore, must conform to the general treatment accorded to the senile state.

MEDICAL NOTES.

Alvarenga Prize of the College of Physicians of Philadelphia.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about $250, will be made on July 14, 1918, providing that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1918.

Each essay must be sent without signature, but must be plainly marked with a motto, and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in the possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1917 has been awarded to Dr. Wilburt C. Davison, Baltimore, for his essay entitled, "The Superiority of Inoculations with Mixed Triple Vaccine (B. typhosus, B. paratyphosus A, and B. paratyphosus B) over Successive Inoculations with the Single Vaccines, as Shown by Agglutinin Curves in Men and Rabbits."

Francis R. Packard, *Secretary*,
19 South 22d Street, Philadelphia, Pa., U.S.A.

Health Commissioner of Kansas City, Mo.—Dr. William Hall Coon, formerly of Wakefield, Mass., and lately executive officer of the Harvard Infantile Paralysis Commission, has received the appointment of health commissioner of Kansas City, Mo. Dr. Coon is a graduate of Harvard Medical School, class of 1895, and has served in the Bellevue Hospital, New York, the Boston City Hospital, and the Northampton State Hospital. He was assistant surgeon in the army during the Spanish War, and at its conclusion established himself in practice in Lawrence, Mass. The late Governor Guild appointed him inspector of the Eighth (North Essex) Medical District, in which position he continued until 1915. He then resigned to associate himself with the Fisk Rubber Company of Springfield, and later the Infantile Paralysis Commission at Harvard.

Hospital Endowment.—Mrs. Abigail E. Geissinger of Danville, Pa., has presented a memorial hospital costing $600,000 to the city and has endowed it for $1,000,000.

Appointments by Industrial Accident Boards.—The following men have been appointed to the Medical Committee by the International Association of Industrial Accident Boards and Commissions: Dr. Francis D. Donoghue, Chairman, Medical Adviser, Massachusetts Industrial Accident Board, Room 272, State House, Boston, Mass.; Dr. W. H. White, Vice-Chairman, Chief Medical Examiner, Industrial Commission of Ohio, Columbus, O.; Dr. Frederick H. Thompson, Chief Medical Adviser, Industrial Accident Commission of Oregon, Salem, Oregon; Dr. B. S. Warren, Surgeon, U. S. Public Health Service, Medical Officer, U. S. Employees' Compensation Commission, Washington, D. C.; Dr. Oliver J. Fay, Medical Adviser, Workmen's Compensation Service of Iowa, State House, Des Moines, Ia. Dr. Raphael Lewy, Chief Medical Examiner, N. Y. State Industrial Commission, 230 Fifth Avenue, New York, N. Y.; Dr. P. B. Maguson, Medical Director, Illinois State Industrial Board, City Hall Square Building, Chicago, Ill.; Dr. Charles H. Lemon, Medical Adviser to Wisconsin Industrial Commission, Milwaukee, Wis.; Dr. J. W. Mowell, Chief Medical Adviser, Industrial Insurance Department of Washington, Olympia, Wash.

WAR NOTES.

A New Anesthetic.—Report is received of a new anesthetic which is being used with much success on the European battlefront. It is called nikalgin, and is composed of quinine, hydrochloric acid and urea. Dr. Gordon Edwards, of Leland Stanford University, who has been a member of the American Ambulance Hospital Corps in Paris, has introduced it, and it is being used in both the Franch and British hospitals with favorable results. Many of the soldiers are provided with small quantities to carry in their first-aid kits. The action of nikalgin in relieving pain in exposed surfaces in wounds is absolute, and a local anesthesia is produced which lasts about three hours. The application may be renewed without harmful effects.

Exemption of Dental Students.—Provost Marshal General Crowder has directed Governor McCall to grant the same privileges to dental students that medical students now possess under paragraph 2, ruling 11. The paragraph reads as follows:

"A hospital interne who is a graduate of a well-recognized medical school or a medical student in his fourth, third or second year in any well-recognized medical school, who has been called by a board and physically examined and accepted, and by or in behalf of whom no claim for exemption or discharge is pending, who has not been ordered to military duty, may apply to the Surgeon-General of the Army to be ordered to report at once to a local board for military duty, and thus be inducted into the military service of the United States, immediately thereupon to be discharged from the national army for the purpose of enlisting in the enlisted reserve corps of the medical department."

Medical Corps Lieutenant Wounded.—During an air raid on the night of September 24, First Lieutenant Howard F. Keating of Philadelphia, Medical Corps, U. S. A., was slightly wounded.

Appointment of Alexander Hamilton Rice. It is announced that Dr. Alexander Hamilton Rice, noted as an explorer and scientist, has been commissioned senior lieutenant in the United States Naval Reserve force, and has been appointed a member of the faculty at the cadet school at Newport, R. I. He will have charge of the teaching of astronomy and navigation.

In the Interests of the War Cripple.—Delegates from nine of the allied countries gathered in London on October 9 to make plans for post-war treatment of soldiers permanently disabled in war. The American delegates were Colonel Birmingham, Major R. B. Osgood, Dr. Veditz and Miss Grace Harper.

Appointments in Association of Military Surgeons.—At the convention of the Association of Military Surgeons, held at Ft. Benjamin Harrison, Dr. George A. Lung, medical director of the United States Navy, was elected president, Col. Edward Munson was reëlected secretary, and Assistant Surgeon-General W. Colby Rucker of the United States Public Health Service was named treasurer. The organization of an association of presidents of examining boards of the Medical Reserve Corps was begun, and will be completed at the next convention, to be held in Chicago, October 22.

War Relief of Rockefeller Foundation.—The recently published report of the Rockefeller Foundation states that during the year 1916 the following sums were given for war relief work:

The principal work of the Foundation was divided among the War Relief Commission, with expenditures of $966,667; the International Health Board, $505,900; and the China Medical Board, $549,558.

The following items are included in the expenditures for war relief: Armenian and Syrian relief, $490,000; Belgian relief, $30,000; International Committee of Young Men's Christian Associations, $295,000; Polish relief, $25,531.32; prisoners of war, welfare work, $378; Serbian relief, $59,562.72; Turkish relief (American Red Cross), $25,000.

Columbia University War Hospital.—A war hospital of five hundred bed capacity, which was begun by Columbia University on April 2, has been completed and opened by Dr. Nicholas Murray Butler. The government has accepted the hospital, and it will be named United States General Hospital No. 1. It consists of fifty-four wooden buildings, covering fourteen acres, and includes kitchen, reception ward, laundry, laboratory, pharmacy, dispensary, operating rooms and wards. A staff of twenty surgeons and doctors and seventy-five nurses will be in charge to receive and care for wounded soldiers from overseas as it now cares for soldiers disabled by sickness and accident. The buildings are single story, metal and frame structures, according to the design of a regulation field hospital, and although they are built solidly enough for permanent location here, they can be taken apart and transported elsewhere if desirable.

War Relief Funds.—On October 20 the totals of two of the principal New England war relief funds reached the following amounts:

Armenian Fund	$238,745.54
Italian Fund	50,300.44

BOSTON AND MASSACHUSETTS.

Springfield Academy of Medicine.—The October meeting was held at 137½ State Street, Springfield, on Tuesday evening, October 16 Dr. William Muhlberg of Cincinnati spoke on "The Doctor and the Insurance Company."

Enlargement of Tufts Medical School.—One section of the new building at Tufts Medical School has been completed in time to admit the entering classes, which, this year, include the premedical students. The medical course has been lengthened by two years, in accordance with the requirements of the American Medical Association. The new building contains three stories and basement, and is built of reinforced concrete throughout. The first and second floors are arranged for classroom use, and the third story will be devoted to classes in dissecting and operating. Registration in the medical school compares favorably with figures of past years.

MASSACHUSETTS WOMEN'S HOSPITAL.—Wednesday, October 17, was held as donation day by the Massachusetts Women's Hospital, Parker Hill Avenue, Roxbury. The officers of the Hospital received members and friends in the afternoon. Mrs. William A. White of 249 Warren Street, Roxbury, treasurer, will receive what additional gifts of money or articles as may be sent.

WEEK'S DEATH RATE IN BOSTON.—During the week ending October 13, the number of deaths reported was 236, against 218 last year, with a rate of 15.59, against 14.95 last year. There were 26 deaths under one year of age, against 34 last year.

The number of cases of principal reportable diseases was diphtheria, 71; scarlet fever, 24; measles, 25; whooping cough, 7; typhoid fever, 2; tuberculosis, 43.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 12; measles, 1; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 4; scarlet fever, 2; tuberculosis, 20.

Included in the above were the following non-residents: diphtheria, 2; scarlet fever, 1; tuberculosis, 1.

BABY HYGIENE ASSOCIATION.—Mrs. Lenah Austin Smith, who has been superintendent of nurses of the Baby Hygiene Association, has resigned, and Miss Winifred Rand of Lincoln House has been appointed her successor.

Dr. J. Herbert Young, director of the Association, will be its representative at the eighth annual meeting of the American Association for Study and Prevention of Infant Mortality, to be held in Richmond, Va., October 15-17.

HAMPDEN DISTRICT MEDICAL SOCIETY.—The regular fall meeting of the Society was held at Hotel Worthy, Springfield, Mass., on Tuesday, Oct. 23, 1917, at 4.15 P.M.

Paper for the afternoon: "An Informal Talk on Medical Aspects of the War," Dr. John Bapst Blake of Boston. Dr. Blake is the Chairman, Massachusetts State Committee for National Defense.

Censors meet to examine candidates for admission to the Society at Worthy Hotel on Thursday, Nov. 1, 1917, at 4 P.M.

HERVEY L. SMITH, *Secretary and Treasurer.*

The Massachusetts Medical Society.

NOTES TAKEN AT A HEARING BEFORE THE SPECIAL COMMISSION ON SOCIAL INSURANCE AT THE STATE HOUSE, BOSTON, SEPTEMBER 26, 1917.*

CHAIRMAN: We will resume our hearing on the subject of health insurance, and we have requested the physicians and surgeons to come before us this morning and state what they would like to say in regard to this matter.

DR. A. K. STONE: The notice your secretary sent was that you would give a hearing to the physicians, and especially to the Massachusetts Medical Society. There is no one able to speak for the Society as one person. It is a body of about 3500 members; a number are here today, and would like to address you, but they will give their own personal opinion and not that of the Society.

I would like to say to the Commission that the medical profession is perhaps more shot through at the present time than any other group of men. Boston alone has three units in France at the present time, and there are two more that are awaiting orders to go. There are a large number of regimental officers throughout the State; others have gone to the base hospital cantonments throughout the country, and it is very difficult to get special interest in social insurance at the present hour because of calls upon the medical profession to do extra work for the men that have gone to some service in the State.

I would suggest as the first speaker, Dr. Samuel B. Woodward, of Worcester, who is president of the Massachusetts Medical Society, and in going up and down through the State, he has, perhaps, been able to test the temper of the physicians, and perhaps can give you some information along that special line.

DR. SAMUEL B. WOODWARD, Worcester: I wish to congratulate the State of Massachusetts on one thing: that is, that it is willing, not only to fight the Kaiser and revise its constitution, but it is willing to consider one of the most revolutionary things,—health insurance. I cannot express any opinion for the Massachusetts Medical Society. We have gone into the matter; we had a special meeting of our council last year, and as far as we can get with our knowledge, which we do not think is sufficient for a conclusion,—is to urge delay in consideration.

It does happen that in the course of my duties, I have to go through the State, to the various districts of the Massachusetts Medical Society,—rather a walking delegate, and in the past year I have been in every part of Massachusetts—from Greenfield to the tip of the Cape and I have made it my business to inquire the opinion of the physicians as regards instituting health insurance, and I think I can truthfully say that, with very few exceptions, I found nobody in favor of it among the physicians.

I have also done another thing. I live in Worcester. I have inquired of the various representatives of organizations there that are interested in public charities, and I have been rather surprised at the result. First, I went to the District Nursing

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* The remarks of the phy[illegible] [illegible] meeting will appear [illegible]

Association,—an association which has been in existence there twelve years. They employ eighteen nurses and make several thousand calls a month. I was surprised to have the agent come out flat foot with the statement that she did not think health insurance was needed in Worcester as a community thing. The agent of the Associated Charities, who has been there a good many years, couldn't make up her mind as to whether the thing ought to be done or not. One agent of the Society for the Prevention of Cruelty to Children (of which I happen to be president) didn't see a call for it. The agent at the Temporary Home didn't know anything about it. That is the result in Worcester.

I cannot say anything more for the Massachusetts Medical Society than that we are looking into the subject just as you are; it is a tremendous thing. I have yet to be convinced, and I have done a certain amount of reading, that the countries where it is in service,—particularly in Germany,—have found it a success. If it were a success in Germany, I should not believe it would be a success necessarily in Massachusetts. We are not Germans; we cannot be fed out of a spoon, as they seem to like to be. That is my individual opinion.

Dr. Stone: Dr. Howland of the Massachusetts General Hospital has come down to say something about the extent that the out-door clinics are used. He is the acting superintendent of the Massachusetts General Hospital, and they have a large out-patient department there.

Dr. Joseph B. Howland, of the Massachusetts General Hospital: I don't know that I know just exactly what you want me to say to you, but our Out-Patient Department last year had about 200,000 visits. Of those, 31,000 were different individuals. About 14,000 were adult men, 10,000 women, and 6000 children under 12 years of age. That gives you an idea of about the way the department serves the community.

Rep. Greenwood: How far do you go with those patients?

Ans. If we once accept a patient, we continue with him as an out-patient if he is able to go back and forth to his home; if not, we recommend him for admission to the hospital, and, if possible, accept him in the hospital.

Rep. Greenwood: Isn't it a fact that you recommend them just as far as possible to a physician outside the hospital?

Ans. It is not the practice of the hospital. There may come there those who seem suited to go to a physician; but as a matter of fact we usually encourage the people to have their own doctor send them, which establishes the status of the patient.

Rep. Greenwood: In the case of a man who has some serious trouble, do you look into his financial standing, and if he is able to pay, send him back to his own doctor?

Ans. Yes.

Rep. Greenwood: Supposing he isn't satisfied with his own doctor; or perhaps he hasn't any; he comes on his own hook and is really an out-patient?

Ans. If he is in our opinion financially able to take care of it, we would not take him; but if he has no doctor and wants to go to one of our doctors, we let him pick out the one he wants to go to.

Rep. Greenwood: How would you regard the extension of this system of medicine by dispensaries or anything of that kind?

Ans. I do not feel competent to pass on social insurance; I have not gone into it.

Rep. Greenwood: I was questioning whether, if it is good for Boston under your institution, further dispensaries would be advantageous to the people and not unfair to the physicians?

Ans. I think a good dispensary anywhere is very good. It would do about the same work we do. They are a help to the medical profession. We often take the patients in to help the doctor to get straight on his diagnosis because of the facilities we have.

Sen. Washburn: You have within reach of your hospital the most eminent medical talent in the State?

Ans. We have as good as there are.

Sen. Washburn: Suppose a man comes to your hospital and you sound his solvency and find he has a little too much money to stay there, then he is sent away?

Ans. Yes, sir.

Sen. Washburn: And yet you may be sending away a man who, if he could stay in your hospital, would have the advantage of having the most eminent talent, and yet can't buy the best outside?

Ans. Yes, sir.

Sen. Washburn: Can you devise any way to get round that evil, and any way that health can be within the reach of a man of modest resources?

Ans. We are providing pretty well, we think, for those who cannot afford eminent people, and we hope to have a ward for those who cannot afford the best. It is a rule that no doctor can take a fee of any kind for work in our wards. We have it in mind that perhaps patients may pay comparatively small fees for our care and yet pay small fees to our physicians; that is not brought about yet. We have not made much progress in that yet, but perhaps it is progress to have it in mind all the time.

Chairman Wilson: You spoke of 200,000 visits annually, or 31,000 individuals. Have you any figures showing what proportion of that number come from Boston,—from within the confines of the city itself?

Ans. Yes, we have some, but I haven't them with me.

Rep. Greenwood: You don't restrict them to Boston?

Ans. We make no restrictions in our Out-Patient Department. Many of them come from the Provinces.

Chairman Wilson: You receive some money from the State?

Ans. No, we receive no money from the City, County, or State; have not since 1817, at which time a house was given us. We have had no State aid since then.

Chairman Wilson: Do you think it would help if the State should establish State Dispensaries, under the Department of Health, for instance?

Ans. I haven't thought the matter over enough to care to state an opinion.

Sen. Greenwood: You charge a small fee?

Ans. Yes, twenty-five cents for adults. If they are not able to pay, we accept them just the same, for nothing.

Rep. Frothingham: You have a good many who can pay, but try to give the impression they haven't any money when they really have?

Ans. We have a good many of them because they want the best, not because they want to beat the medical profession. We have some who want to get something for nothing, but are able to pay. So far as possible, we rule them out.

Dr. Stone: I am going to ask Dr. Mongan of Somerville, who has given this subject a great deal of study, to speak to you now.

Dr. Charles E. Mongan, Somerville: In the first place, I have no hostile spirit whatever, and it is very clear in my mind why I am here. I represent the Somerville Medical Society, which is opposed to any health insurance measure at this time And to enlighten Senator Washburn, I will say that I am a member of the committee of 23 of the Massachusetts Medical Society, which committee was called into existence by vote of the council for the purpose of studying health insurance,—social insurance. I have one request to make of the Commission: That I shall not be interrupted by any question until I have finished.

Social insurance, health insurance,—whatever you may term it,—is a broad question, and is one of those questions that have come into our social existence from across the water; and I wish you to understand that health insurance, compulsory or non-compulsory, is only one part. There are three other parts: Invalidity insurance, insurance of the unemployed, and old-age pension. One of the most enthusiastic promoters of social insurance said that it was the intention of the gentlemen who were behind the scheme that after health insurance had been put on the statute books, to ask for invalidity insurance, insurance of the unemployed, and old-age pension; and you can't divorce any one of these things from the other—if you must have one of these things you must have the rest. That is the question,—the broad proposition: Whether or no Massachusetts wishes to embark on such a proposition.

And as to the other question: Whether or no there is any necessity for it, compulsory or non-compulsory, "who says there is?" There is no society, lay or otherwise, that has demanded it in Massachusetts. Whence comes it? From the office of that society which places those books upon your table: [Dr. Mongan referred to copies of a publication that had been placed on the table in front of the chair of each Commissioner. This publication was issued by the American Association for Labor Legislation.] The American Association for Labor Legislation, an international association which has branches in 16 different countries, has headquarters at Basle, Switzerland. The officers of this association say that the object of the association is the standardization of labor laws in all countries. It is an association outside the Government, working to pass laws; it is a purely German invention, based upon the German genius of civilization.

Now let me read a quotation from an article in the *Yale Review*, by Professor Hadley, on "The Political Teachings of Treitschke." The article appears in the January number, 1915. Treitschke says: "Every civilized state is an aristocracy. If its political constitution is democratic, it arranges some sort of aristocracy outside of its constitution to manage its affairs." So, you see, the United States was to be standardized before the periscope of the Kaiser's submarine appeared off Sandy Hook.

The germ of health insurance came from Russia. In 1806 the Czar issued an order compelling factories employing a thousand men and over to have a doctor. In 1866 this idea was made more comprehensive, and factories employing five hundred or more were compelled to employ doctors, and even obstetric hospitals were founded in connection with manufacturing establishments. Germany adopted social insurance as a political measure, at the instance of the Socialist, and as a sop to the Socialists. What are the conditions in Germany? You have a homogeneous race, speaking one language, one fountain-head from which all laws come, 65,-000,000 people thinking in one way about all things. It was for the interest of the empire that the health of the people should be cared for by the government. In all those countries which have compulsory health insurance, the individual is submerged; these countries are monarchies or great autocracies. We have heard nothing of compulsory health insurance in France or Switzerland,—countries that correspond more to the United States, where the individual does amount to something.

What are the conditions that called for compulsory health insurance in Germany? Mr. Gerard, in his recent article on Germany, said that 55% of the families of the wage-earners of Berlin live in one room. I will venture to say that among the wage-earners who are employed in that great establishment in Cambridge over which one of the honorable members of this commission presides, of all those wage-earners, there is not one family that lives in one room.

Again let me read concerning hearings before the Committee on Ways and Means of the National House of Representatives, in 1913; this is the testimony of a delegate to the International Glass Blowers Convention, which had been held in Europe shortly before: "I am quite sure that I cannot use language that would render you sensitive to the vast difference in the conditions prevailing in Germany as compared with those prevailing in our country, principally as it applies to child labor. In certain cases men own or rent a little farm, and may live from 5 to 10 miles from the factory in which they are employed. They walk to the factory on Sunday night, and sleep and eat at the factory each day and night during the week, returning to their homes on Saturday night." Contrast that condition with conditions in Massachusetts, where, if the savings contained in the savings banks, and in the savings departments of trust companies, and in the coöperative banks were equally divided, there would be for every man, woman and child $300.00. In a report issued by the Boston Chamber of Commerce recently, it was stated that if the wealth of Boston was equally divided among its inhabitants, there would be for each inhabitant, over $2000, the highest per capita wealth of any city in the United States. Massachusetts is a highly civilized and highly developed commonwealth.

This is a highly civilized and developed commonwealth, which does not show, as far as we have been able to see as medical men, that there is any need of compulsory health insurance if we are to live up to the teachings of the Constitution,—that this country is made up of individuals. We are told by the insurance companies that there is a certain amount of sickness in the United States, and we have come here, as members of the community, to help you. You ask us what we have to offer. We tell you that we are studying the question, and it is so enormous and has so many aspects that it will be impossible for any community to say what would be a proper bill and what would not be a proper bill, and whether you want a bill or not.

You had here last week a gentleman from Worcester, Mr. Dresser, and Mr. Dresser, I think, falls into the same notion that perhaps my friend from Worcester did, as I gathered from his questions, as to the term *preventive medicine.* The physician means by *preventive medicine* all those means and ways by which disease can be eliminated or arrested. Under health insurance, Germany has not improved or progressed as far as the United States in preventive medicine. I was surprised in reading Mr. Dresser's remarks, that he did not know that. The United States leads the world in preventive medicine; and I do not hesitate to state that Massachusetts leads the United States. All the rules about health came from the medical profession, and yet Mr. Dresser said we were not organized. We were not disorganized when we told you about tuberculosis, about sanitation, about pure food laws, etc. The members of our Society have always looked into these matters, have gone to Boards of Health and to the Legislature; and to the honor of Massachusetts it took the advice of the medical men, and has placed upon its statute book laws which provide for the care of the health of the citizens, and thus disease has been prevented. In consequence of these deeds, doctors have not been on the increase, but the decrease. It is said that there are not enough doctors to respond to the call of the National Government for medical men. The reason is the elimination of disease. The Medical School is the only school connected with Harvard University that has shown in the past a falling off in membership.

In regard to factory sanitation, Mr. Dresser gave you a very elaborate description of what was done in the Norton Grinding Company, but he forgot to tell you there was another side to that question; there are some questions that are asked when an employee goes to the Norton Grinding Company. One question is, "What is your age?" Dr. Clark tells of it in an article on factory inspection in the A. M. A. journal. If a man is 45 years of age, he is arbitrarily rejected. In other words, he is industrially dead at 45. Compulsory health insurance means compulsory physical examination, and the employer will demand, as he should demand, a perfect man if he can find him. The Norton Company is not the only company that sets an age limit and compulsory physical examination. The laboring man tells you he objects to being junked at 45 or 50. A man is refused work in a factory because he is 45 years old and is industrially dead. Let us see how that works out. The day he receives this information, his boy at the age of 18, who has passed successfully his examinations for admission to the technical school of which one of the members of this Commission is trustee, and has been told that he will be admitted to the freshman class, goes home in great joy to tell his parents of his success, only to find when he has entered that home that his father is industrially dead; and the education that the boy looked forward to, and set his soul upon, will be denied him, for he must forthwith take the place of his industrially dead father, and go to work in order that he may contribute to the support of the family.

Those are some of the reasons we ask you to consider, and go slowly. Those are some of the reasons why we ask you to think seriously over this question. We also ask you to consider and investigate whether we have not means of alleviating what sickness there is, and we will ask you to investigate every public hospital in Massachusetts. As business men and doctors, investigate in every way before you come to a conclusion. Make it a friendly investigation. We ask you to use your ability as leaders of industry to find out the cost of maintaining those institutions; go all through the cost of supplies, etc. It is your duty, before you report any bill, to investigate every possible aspect of this question. We want you to see if you cannot devise a means of relieving distress or sickness, without interfering with or confiscating anybody's means of livelihood or putting on the State an enormous cost that will be more than they realize. I realize more and more, as I study it, the deep problem that you men have to consider; and I realize, too, that it can't be settled by any figures that you take from Germany, or Switzerland, or France, or England. England has more slums, more ill-fed, more underpaid workingmen than any civilized country in Christendom. You have got to settle the question by what Massachusetts demands and what Massachusetts needs.

There have been many suggestions given you today or in previous times, which have been termed constructive. We have been asked what we had to offer in a constructive way. Gentlemen, it is all foolish to construct when we don't know the basis of the foundation on which we are to put the superstructure. The Commission of last year could not agree upon any report. Now there isn't any constructive legislation that I know of; we are simply groping in the dark; but if this Commission thinks that Massachusetts should be committed to health insurance, if the State should take the part of caring for the health of its inhabitants, then I say, take the short cut, and proper way; and the proper way will be for the State, if you decide that it is to take over the care of the people of the Commonwealth, to do it in the same way as you offer police protection, and protection from fire, and it won't cost so much—let all the citizens come under it. The United States educates the officers of its army and navy; in the same way the state of Massachusetts can establish medical schools and examine every candidate, who will be free to come, mentally and physically, and then nobody will have the right to practise medicine or surgery unless under the rigid supervision of the proper authorities, and the most expert advice will be within the reach of the richest and the poorest in the Commonwealth.

There is another means that has been hinted at by Mr. Dresser: that is the establishment of stations in various parts of the community, under the supervision of the board of health. If the board of health were a state board and appointed by the governor, or perhaps elected by the people, and had full power over the whole State, and control of all conditions pertaining to the health and sanitation of the State, you might be able to devise a measure that would relieve any shortcomings that are said now to exist; but in looking over the statistics that have been brought to you by insurance companies, you must remember how they are collected. They are collected by laymen and not by doctors. The Metropolitan Life Insurance Company is conducting a health survey along scientific lines at Framingham, and it is said that it will take from three to five years to complete the survey, and that it will cost $100,000.

I haven't anything further to contribute, except this: that this committee, on the part of the Massachusets Medical Society, is willing and anxious to help to solve any medical problem that can be proven to exist in Massachusetts. It will give you any information and aid you in any way possible.

Senator Brown: You say your association will help along the lines that this Commission is seeking. Last year, I understand, you appeared before a similar commission. What has your society done within the twelve months?

Ans. It hasn't been twelve months since we appeared. We appeared before your Commission on the 8th day of December, and we asked the Commission then to allow us time to investigate this subject. We were very well received, but the Commission took no notice of our request. Since then, we appointed a committee of 23, which is investigating this subject. Most of us are very busy men and work as we are able to through the societies to get what data we can. We say frankly that we haven't gone on very far in getting data, because we have not been able to organize in the way we would like; such an investigation would cost between $10,000 and $5,000. The Council of the Medical Society appropriated $5000 for the use of the committee of 23.

Rep. Greenwood: Would your board feel warranted in taking any general action before bringing it before the general society?

Ans. No, and not without further knowledge. This came on the medical profession rather suddenly, and previous to November, 1916, I don't believe we knew much about health legislation.

Rep. Greenwood: What do you think of the dispensary proposition? If they were run properly and under the absolute control of proper authorities and were perfectly equipped, what would be the effect on the communities and the physicians?

Ans. That is a rather general statement.

Rep. Greenwood: There would be conditions in almost any fair-sized city where such stations might be established, so some people who are really suffering from the want of medical aid might receive attention at less expense, just as they do at the Massachusetts General and the North End Dispensary.

Ans. I think the greatest expense to such comes in getting special diagnoses, laboratory work, x-rays, etc. There could be stations where anybody would be free to go and get such help; or if he so desired, he could patronize anybody outside. I think the great benefit would come to the doctor: it would be a place where he could go for aid in diagnosis when a case is obscure; instead of asking patients to come to the hospitals situated in large cities, where on account of conditions intensive study cannot be given to every case.

Rep. Greenwood: Couldn't they extend the psychopathic work that is now being done, and hold clinics in different parts of the State, and so reach those who cannot come to the Fenway? It seems to me it might be very helpful and preventive.

Ans. Yes.

Mr. Morss: You don't believe in compulsory health insurance?

Ans. No. We have been giving you what no other profession gives. We tell you what you may do so that you may keep well, and thus we try to eliminate disease. We have been telling that for years, so that now there are fewer doctors in proportion to the population than there were fifteen years ago. We are all striving for perfection. We strive for perfection in medicine as you do in industry.

You want, first, to make sure that the things you propose to correct, exist. I would rather assume that they do not exist until it is proved that they do. There is no need of legislation such as was proposed last year.

Mr. Morss: You haven't any legislation to propose?

Ans. If the Commission decide there is need for legislation, then I am willing to sit down and talk it over. I want to be shown before the Commonwealth is saddled with an expense that is greater than she spends now for public education. The proponents say it will cost twenty-four million; public education in Massachusetts costs twenty-two million. If it is needed, I will be an enthusiastic citizen and help put it through.

Rep. Greenwood: There is some indication that the psychopathic proposition has developed or discovered a need in the community; it is a new revelation.

Ans. We can eliminate that by saying that the study of insanity done in connection with the psychopathic hospital gives evidence of great promise for the future. I think the study of diseases of the mind, as is now being conducted by the alienist, is bound to change our notion of mental diseases, and in a few years, as the result of these studies, I think we will have an entirely new procedure in regard to the insane; and our treatment of the imbecile, feeble-minded, and the criminal will undergo radical changes.

Senator Brown: Isn't it a fact that in these insane hospitals there is very little medicine given the patient?

Ans. Any medicine given in any hospital by any physician is given only when there is a definite need for it. There are drug treatments, baths, rest, and dietetic treatments. Physicians are not tied down to the use of drugs for the care of the insane, but it is called medical care whatever the treatment may be. Very little drugs may be used.

In answer to a question from Rep. Washburn, Dr. Mongan stated that he was a member of the committee of 23 of the Massachusetts Medical Society to study the matter of health insurance, appointed by the Council, which is the governing body of the Society. Each district was to have a representative on the committee. The committee made a partial report in June, simply on organization. The next report will be made at the meeting of the Council in October. The Society has taken no official action on the subject of social insurance. It is simply studying the matter, like the Commission.

Rep. Greenwood: Will your report probably be complete enough in October to give us a statement of their attitude?

Ans. I don't think so; not much before December.

In answer to Chairman Wilson's question as to whether he had any idea how the bill was working in England, Dr. Mongan said:

A recent letter in the *Journal of the American Medical Association* said that many there were for and many against it; they didn't actually know whether it was working well or not. It has not cleaned up the slums. It has also put a lot of detail on the doctor, who has to make numerous reports. Everybody who is sick is catalogued.

Mr. Washburn: Are you a general practitioner?

Ans. Yes. I practise in Somerville. I am one of the visiting physicians of the Somerville Hospital.

P. S.—Since this hearing was held, a report comes from England that Lloyd George says this is no time to discuss health insurance.

NOTES FROM THE DISTRICT SOCIETIES.

District Correspondents.

Berkshire, **A. P. Merrill, M.D., Pittsfield.**
Bristol North, **Arthur R. Crandell, M.D., Taunton.**
Bristol South, **Edwin D. Gardner, M.D., New Bedford.**
Essex North, **T. N. Stone, M.D., Haverhill.**
Essex South, **H. P. Bennett, M.D., Lynn.**
Hampden, **Laurence D. Chapin, M.D., Springfield.**
Hampshire, **E. E. Thomas, M.D., Northampton.**
Middlesex South, William C. Hanson, M.D., Belmont.

Essex South District Medical Society.—The first regular meeting of the Essex South District Medical Society was held October 2 at the Salem Club, Salem. Dr. Edw. H. Risley, Boston, was the guest of the evening, and he gave a very interesting talk on "The Modern Treatment of Burns, with Especial Reference to the Use of Ambrine and Similar Preparations." Dr. Walter P. Bowers of the State Board of Registration in Medicine, and remembered as a welcome visitor when he was president of the State Society, was also a guest. Dr. Bowers spoke briefly in regard to the need of physicians informing themselves in regard to the pending health insurance legislation.

The Special Commission on Social Insurance will hold a public hearing in Lynn, Oct. 25, at 7.30 p.m., in the Council Chamber at City Hall. "Health Insurance" will be the topic of the hearing. Physicians of the District would do well to attend this hearing. The Censors of the Essex South District will be at the Salem Hospital Thursday, Nov. 1, at 3 p.m. Any of the members knowing desirable candidates should put them in touch with the Secretary at least a week before the meeting.

H. P. Bennett, *Secretary.*

Obituary.

GEORGE PLUMMER HOWE, M.D.
1878-1917.

The death of Dr. George P. Howe, on September 28, 1917, on the field of Mars, carries with it the distinction of being the first graduate of the Harvard Medical School, the first alumnus of the Boston City Hospital, and the first Boston physician to be sacrificed in the devastating war now raging.

In the career of Dr. Howe, there were two predominant motives or root ideas that swayed his conduct of life. One was his desire to be useful to mankind, the other his insatiable longing for adventure. The former held in restraint the latter, thereby leading him to the practice of medicine. The second, when unfettered, irresistibly drove him to fields of exploration.

Almost immediately after he had finished his service as house pupil at the Boston City Hospital, he signed on as surgeon of the Anglo-American Arctic expedition, and in company with the distinguished Arctic explorer Stefansson, spent a year in the Polar regions. When he came home from this voyage, he began the practice of medicine in Lawrence. It was not long after his return, however, before he was again flirting with the siren of travel. This time, she led him on the W. B. Cabot expedition to the interior of Labrador. When he came back from this journey, he became connected with the Peabody Museum of Anthropology, and subsequently led his own expedition to Yucatan for the purpose of investigating Maya culture. When he returned home this time, he married Miss Marion Dudley Endicott, and soon after began to specialize in dermatology in Boston.

Endowed with perfect health, and possessing a physique as tough as old hickory, he was by nature fitted to sail the "Seven Seas." In tastes and thought, he was a citizen of the world. In manner, he was retiring, at times being as silent as an Indian and as deliberate as a lawyer's brief. He had a keen judgment, which made him an able and helpful critic. As an authority on Arctic matters, he stood high. He was an omnivorous reader, with a retentive memory. His conversation was illuminated by a dry humor and his thoughts seemed to come from an inexhaustible reservoir of information. He could talk intelligently and entertainingly on almost any topic, from the blending of Turkish tobacco to an abstract problem of navigation. He could tell an after-dinner story to the merriment of all present. His activities led him to take up as a hobby, at one time wrestling, at another time the invention of an automatic pistol.

His modesty prevented him, much to his own loss, from using the trumpet and drum to herald his exploits. Glamour never attracted him, and he would never cater to the gallery.

Though aristocratic in tendency, he was essentially gregarious, loved club life and animation. In brief, he was a delightful, dashing companion.

He was eminently suited for the vocation of medicine, having been born and reared in a professional atmosphere, and later trained in this great center of medical education.

As an assistant, he was able and faithful in his work, never shirked the routine duties to be found in a large metropolitan clinic. Kind and honest with his patients, he looked upon the privilege of helping them as the luxury of usefulness. At the time of his death, he was assistant in the department of diseases of the skin at the Boston City Hospital and the Carney Hospital. He held membership in the New England Society for Dermatology and Syphilis, in the Massachusetts Medical Society, in the American Medical Association, and was a member of Chapter 1904 of the Æsculapian Club of the Harvard Medical School.

He had an unbounded admiration for the German military machine and was a close student of the war and its strategy. This interest led him, about a year and a half before the United States declared war on Germany, to signify his intention of "getting into the fight" if this should occur, and in anticipation of this event, he joined the first Plattsburg training school.

About the latter part of May of this year, he received his commission as a member of the Officers' Medical Reserve Corps. Later in the month he sailed on the steamer *Mongolian*, detailed by the United States army to the British forces. After serving for a while in Field Ambulance No. 48, in the Ypres Sector, he was eventually assigned to duty as Battalion Medical Officer to the Tenth Battalion of the Royal Fusiliers, stationed "somewhere" at the front in Flanders.

He found his last exploit set in an environment in perfect accord with his ideas of life, dying the way he had lived, in the midst of adventure, useful to the last. His saddened friends may well envy this glorious termination of his career. *Pax vobiscum.*

Townsend W. Thorndike.

Miscellany.

RESOLUTIONS.

At the semi-annual meting of the Middlesex South District Medical Society, the following resolutions, presented by Dr. Arthur N. Makechnie of Cambridge, were unanimously adopted:

Whereas, Some of the daily papers of Boston have severely criticized the physicians who were appointed to examine for the Exemption Boards,

Resolved, That we, members of the Middlesex South District Medical Society, feel that some notice should be taken of this, as the criticism was very unjust. We feel that the following facts should be stated:

1. The instructions specified that if there was any doubt about a case, it was to be sent along.

2. The Government did not supply those different means of diagnosis which are used in private practice and are at the command of the army doctors. For example, the Wassermann test for venereal disease and sputum examination for tuberculosis.

3. They also had instructions to send along most cases of venereal disease, to be passed upon later.

4. The Government ordered 10% surplus to be sent, expecting that number to be rejected, which accounts for the shrinkage that was misunderstood and misrepresented.

5. As all the examining physicians either gave their services, or received a very small remuneration, it seems to us that appreciation of their services would be more fitting than censure, and that a continued unjust censure of the doctors by people ignorant of the facts, will make the doctors unwilling to serve in this capacity.

Resolved, That copies of the above be sent to the Surgeon-General, the Adjutant General, and the Boston daily papers.

Lyman S. Hapgood, *Secretary.*

Correspondence.

THE DOCTOR AND THE DRAFT.

Cambridge, Oct. 13, 1917.

Mr. Editor:

Much criticism, directed chiefly against draft physicians of Boston, has appeared recently in the daily press. If we can believe the stories of carelessness on the part of the examining physicians of the selection boards, medical standards have indeed reached a low level and such practitioners constitute a positive danger to the community. The medical journals have been wisely silent. The general public, guided by the daily newspaper, is convinced that the work of draft examinations has been poorly done.

In a recent editorial entitled "Shameful Conduct," a leading Boston paper violently attacks the examiners of the Selection Boards. It is unfortunate that this newspaper, which is generally regarded as eminently fair, should publish so caustic an article, unmindful of the rules and conditions under which the physical tests have been made. To the author of the above-named editorial it may be a matter of interest to know that, in accordance with the draft regulations, many men who never even appeared for examination were sent to the mobilization camp. As an instance: a man claiming to be a resident alien whose examination is postponed in accordance with Section 16 of the Draft Rules, fails to file his affidavit in support of his claim for exemption. In due time he must be certified to the District Board and forwarded to Ayer regardless of his physical condition.

In the course of the examinations, efforts were made by some of the registrants to deceive the doctor, and he is warned in the rules to protect both the government and himself against these attempts at deception. All doubtful cases must, by order of the Provost Marshal General, be resolved in favor of the government, and all such men are held for military service. It is perfectly clear that the army surgeons, with the facilities for observation in the regimental infirmary or base hospital, possess much better opportunities than the civilian physician to sift out doubtful cases. Moreover, urinalysis, sputa and Wassermann tests, not included in the routine preliminary examinations, are used extensively at the mobilization camp.

The editorial referred to above speaks of the grave danger in the selection and certification of men afflicted with tuberculosis and venereal disease. This is admittedly true. But there are stages of tubercular infection in which it is impossible, in but one examination, to determine an absolute diagnosis. Even with the advantages of bacteriological tests and day to day examinations, there are now segregated at the camp many men of whose condition the army surgeons are still undecided. And, according to the rules governing physical examinations, there is one common and most serious social disease which is not disqualifying. This disease is referred to by Dr. Osler as possible of "permanent damage to the individual himself and still more to the 'grisly troop' which follow in its train." Certain complications of this disease, however, are causes for rejection. But a man's physical condition may vary from week to week, or even from day to day, and it should be remembered that many men were not sent to camp until a month or more had elapsed from date of examination, so that recent contractions of disease and the complications in existing conditions should be considered. These are, undoubtedly, some of the reasons why the War Department ordered each local board to certify 10% over its quota.

The editorial states that "it is ludicrous that physicians should have approved epileptics." Even a layman is aware that in this functional nervous disease a patient may often exhibit absolutely no organic disorder, and, if sensitive about mentioning his trouble, might be accepted by any examiner until the test of time and observation can establish the true diagnosis.

The percentage of rejections, therefore, is no criterion to judge the degree of skill or care exercised by the examining physicians. It happens that the writer is the medical member of a selection board which, up to date, has had no rejections of any of its accepted men. This means that we have been lucky, and nothing more, for it is quite possible that some of our selected men, now drilling in Ayer, may under intensive military training, suffer with broken arches or fall to the ground in the diagnostic convulsive seizure of epilepsy.

The doctors whom the President has appointed to the local boards are mostly, mature men of at least some standing in their respective communities. They and their assistants have sacrificed their civil practice and income and given freely of their time in the great work of the selective draft. In their attempt to protect the government and to follow the rules laid down by the Surgeon General, they have subjected themselves to much severe criticism which is entirely undeserved.

HENRY O. MARCY, M.D.,
Draft Selection Board, Cambridge, Division 1.

VERBUM SAPIENTIBUS.

Boston, Oct. 12, 1917.

Mr. Editor:

Your readers will do well to be on their guard against the engaging manners and plausible statements of a medical gentleman, recently a resident of Los Angeles, who professes an intimate knowledge of eminent medical men, well known here twenty-five and more years ago, and who usually ends an entertaining conversation with an appeal for a small loan of money. "A word to the wise is sufficient."

Yours truly
VINCENT Y. BOWDITCH.

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SOCIETY NOTICES.

THE HARVEY SOCIETY.—The first lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, October 27th, 1917, at 8.30 P.M., by Prof. W. T. Porter, of Harvard. Subject. "Shock: Observations at the Front."

MASSACHUSETTS MEDICAL BENEVOLENT SOCIETY.—The annual meeting will be held at the Boston Medical Library at 5.30 P.M., on Thursday, Oct. 25, 1917.

The Council will meet at the same place at 5.15 P.M. It includes the following officers: President, Vice-President, Treasurer, Secretary and the following Trustees: Drs. H. Gage, F. B. Lund, F. W. Taylor, F. G. Balch, G. G. Sears, E. C. Streeter, S. J. Mixter, B. Vincent and J. Bryant.

R. M. GREEN, M.D., *Secretary.*

NORFOLK DISTRICT MEDICAL SOCIETY.—A stated meeting of the Society will be held at the Roxbury Masonic Temple, 171 Warren Street, Tuesday, Oct. 30, at 8 P.M. sharp.

Business

Communication: A Symposium on Venereal Prophylaxis.

Social Aspect, Bishop William Lawrence.
Medical Aspect, C. Morton Smith, M.D.

The Censors will meet November 8, at 2 P.M., for the examination of candidates.

BRADFORD KENT, M.D., *Secretary.*

SUFFOLK DISTRICT MEDICAL SOCIETY.—A stated meeting of the Society will be held on Wednesday, Oct. 24, 1917, at the Boston Medical Library, 8 The Fenway, at 8.15 P.M.

Business: Election of Nominating and Auditing Committees.

Paper: "Repeated Caesarean Section," Dr. J. Whitridge Williams, Baltimore.

Discussion by Drs. Edward Reynolds, F. S. Newell, H. T. Swain and N. R. Mason

Refreshments after the meeting

GILBERT SMITH, M.D., *Secretary.*

CENSORS' EXAMINATION.

The Censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at 8 The Fenway, on Thursday, Nov. 1, 1917, at 4 P.M.

Candidates, who must be residents of Suffolk District or non-residents of Massachusetts, should make personal application to the Secretary, and present their medical diplomas, at least three days before the examination.

For further particulars, apply from 2 to 4 P.M. to
GEORGE GILBERT SMITH, *Secretary.*
99 Commonwealth Avenue.

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RECENT DEATHS.

FRANK H. GARDNER, M.D., of Portland, Me., died at his home in that city on October 7. He was born in 1854 and graduated from Bowdoin Medical College and Maine Medical School. He began practice in Washburn, Maine, later moved to Harpswell, Maine, and about twenty-one years ago he removed to Portland where he remained in practice until about two years ago. He is survived by his widow and one daughter.

The Boston Medical and Surgical Journal

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THE USE OF NORMAL BLOOD SERUM, PARTICULARLY WITH REFERENCE TO THE TREATMENT OF WOUNDS.

Studies in Serum Therapy.* II.

By Timothy Leary, M.D., Boston.

[From the Laboratories of Pathology and Bacteriology of the Tufts College Medical School.]

INTRODUCTION.

The materia medica is made up in large part of substances which have been wrested by more or less complex methods from the vegetable and mineral kingdoms.

The animal kingdom, containing our nearest neighbors biologically, has been, until recent years, overlooked in large part in our search for medicinal agents. In this limited period, however, there has been discovered the largest group of specific agents known to medicine, whose number is increasing as our researches extend.

In addition to the natural products of animal origin, *e.g.*, extracts of the ductless glands, we have succeeded, by artificially stimulating the defensive machinery of animals, in producing a group of specific anti-bacterial and antitoxic agents, whose evolution is the flower of modern research in medicine.

When man fails, through his own natural powers, to supply the protective substances needed to overcome a parasite or its products, we turn to the creatures which respond to infection as man does, and which through their more natural method of existence are able to call into being the required specific protective bodies in greater quantity than weaker man can produce.

It will be noted that in the elaboration of these antisera by animals, the function of man consists only in introducing the bacterium or its products into the healthy animal. The animal does the rest, and does it through a defensive mechanism which is ready to respond to the injection of toxic substances, perhaps unknown to it in its normal existence. The effort by the animal body to neutralize the noxious agents leads to the formation of the specific antisubstances which we use.

The life of the animal, like the life of man, is a constant struggle against parasitic agents which are endeavoring to invade its body, and whose success in this invasion usually results in disease and perhaps death.

Progress in civilization has, through hygienic measures, led to protection of man against contact with harmful agents; through the discovery of protective substances produced by healthy living animals, his struggle against infectious processes is being greatly strengthened; but the stress of the artificial life which civilization produces has resulted in a weakening of his own natural defenses. The free living animal, on the other hand, leading a hygienic life, has conserved its natural resources.

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* For the first paper in this series see Boston Medical and Surgical Journal, 1908, clix, 73. The expenses of this work have been borne out of funds earned by the Department of Pathology and Bacteriology of the Tufts College Medical School.

We have been led, because of the brilliant results obtained by specific antisera, to think of animals, such as the horse, as producers of specific antisera only. It should be remembered, however, that the horse destroys the diphtheria bacillus or its toxin, not because of the possession of specific defenses against these agents, but because of a protective machinery, armed against *any* invader, and producing the specific antibodies needed on call.

Similarly, the domestic animals resist infection by the pus-producing bacteria which infect man, not as the result of possessing specific antibodies against these bacteria, but by virtue of a defensive machinery which attacks *all* invading agents. We should think of these animals, then, as possessing already at any time natural protective properties, having power against *any* parasitic agent, but capable of responding to artificial stimuli by producing in excess specific antibodies against the particular agent injected.

The agencies of defense in animals correspond to the similar agencies in man. We can recognize lytic, precipitating, agglutinating, opsonic and phagocytic properties. All of these agencies, whether general or specific, whether natural or arising as the result of artificial stimulation, are contained in concentration in the blood; and all of these, except the phagocytes, are contained in the serum. This is a matter of common agreement.

From this standpoint, then, the healthy animal which comes to slaughter for food; whose body passes, not a clinical examination, but a detailed anatomical examination of its organs and tissues by an expert, represents the summation of all of the factors needed to resist disease. It has come through a lifetime beset with parasitic enemies, and has emerged unscathed from the battle by virtue of its own physical powers.

It has always seemed to the writer that the serum of such an animal was a precious fluid, whose properties should be used to assist mankind in its struggle against disease.

WHAT ARE THE PROPERTIES OF NORMAL SERUM?

(A complete review of the properties of serum would embrace a consideration of all of the physical and chemical activities of the body, impossible in the limits of this paper. Reference is made, therefore, only to properties needing consideration from our standpoint.)

1. It is the ideal physiological saline. Artificial salines are only imitations, because it is impossible to reproduce the mineral formula of the serum in aqueous solutions without the introduction of proteids, since some of its salts are in organic combination with proteids. There is close correspondence, qualitatively and quantitatively, between the salts of animal and human sera, which are, therefore, isotonic.

2. It is an antibacterial agent. The first discovery of substances antagonistic to bacteria in the animal body was made by Nuttall,[1] who showed that normal serum possessed the power of destroying bacteria. This action was not specific, but was exhibited against bacteria of many kinds introduced into the fluid. The Alexin (Buchner[2]) which produced this action was a labile body, destroyed by heat (56° C.), easily exhausted by saturation with bacteria, and disappearing if the serum was kept. It was inactive against staphylococci. Later Wright[3] demonstrated the presence of non-specific opsonins in normal sera.

3. It is the repository of the specific antibacterial and antitoxic substances produced as a result of natural infection or intoxication, or of the artificial introduction of antigenic substances.

Becht and Leuckhart[4] have shown that the circulating antibodies are produced in the hemopoietic organs and not in the tissue cells in general. Wherever these substances may be produced they come to be contained in concentration in the blood serum, together with the natural immune bodies.

4. It is a repository of the enzymes produced by the body.

It contains diastases, as well as maltase and other glycolytic enzymes, oxidases, catalases, lipases, rennin and a group of proteolytic enzymes, together with antienzymes.[5]

For a study of the antitryptic action of the serum, the reader is referred to the series of papers by Jobling and his associates, largely published in the *Journal of Experimental Medicine.* From their studies of the antienzyme action of the serum in infection, they conclude that its antiferment power depends upon the amount of unsaturated lipoids present in a highly dispersed state,[6] and find that a low "infection index," observed in various conditions, including carcinoma, pregnancy and following vaccine therapy, is associated with a relatively high antiferment index of the serum.

In addition to the substances mentioned, the blood serum is the carrier of the secretions of the ductless glands.

5. It contains coagulating ferments (thrombin), which are capable of stopping hemorrhage in the hemorrhagic diseases, where the tendency to hemorrhage is general, or where the hemorrhage is local, in the form of oozing (Weil[7]). We have furnished rabbit serum to physicians and hospitals for years for this purpose. (See Paper I, this series.) The value of serum from this standpoint progressively diminishes with its age.

6. Serum or plasma is the agency which has permitted the cultivation *in vitro* of the tissues of the animal body. For this purpose an homologous serum is best, although not essential.[8]

7. It contains proteid substances which, when introduced into the animal body, will provoke specific immunity, or the related change anaphylaxis. In other words, its albumens, like all others, are capable of acting as antigens. In

addition to exciting a specific immune response, its injection produces a non-specific reaction, now being used widely in therapy, which is discussed in some detail later in this paper.

8. With other substances, it possesses the property of provoking a local or general leucocytosis when introduced into the animal body, and is the most desirable agent to use for this purpose. (*Vide infra,* Petit.[9])

RÉSUMÉ.

Normal serum, then, may be accepted as a natural physiological solution, readily miscible with the tissue secretions, and bland in its action, apart from certain toxic and anaphylactic properties, now regarded as useful under proper control (see Paper IV); it possesses natural antibacterial properties; it is the storehouse of the specific antibodies; it contains ferments capable of digesting tissue detritus and exhibiting other useful activities; it is employed successfully in controlling hemorrhage other than that form (rhexis) requiring mechanical control; it is fitted to serve as a culture medium for tissue; it is able to excite the protective machinery in a non-specific manner, useful in therapy; it provokes a desirable leucocytosis, valuable in the treatment of infections.

THE POSSIBLE USES OF NORMAL SERUM IN THERAPY.

In addition to the applications of normal serum mentioned, it has been used in the treatment of disease by mouth administration.[10] For present purposes we must limit ourselves to a consideration of its possible uses in the treatment of wound sepsis.

The conditions under which the present war is being conducted have revolutionized war surgery.

Trench warfare has resulted in inoculation of the mud of the trenches with parasitic organisms, and the infrequently changed clothing, and rarely bathed skins of the men in the trenches, are rich in bacteria. Comparatively clean rifle bullet wounds have been replaced in large part by shell and shrapnel wounds, accompanied by the driving of foreign bodies, fragments of clothing and skin, into the lacerations produced, so that clean wounds are the exception.

Modern surgery in civil life is carried out in large part, under aseptic conditions, which have made possible a wonderful development in the mechanical aspect of the art. Dealing almost wholly with clean cases, the surgeon, after carrying out the necessary operative procedures in the exceptional septic case, usually turns over its care to assistant or house officer, who, in turn, oftentimes delegates his responsibilities to the nurse. This attitude has led to little progress in the treatment of septic wounds from the time of our Civil War up to the present conflict. However, certain cardinal principles of treatment are established: the removal of foreign bodies and dead tissue, drainage, and the use of antiseptics.

There can be no discussion about the first two of these principles. Our problem deals with the third.

WHAT ARE THE REQUIREMENTS OF AN ANTISEPTIC AGENT?

1. *It should be able to kill or prevent the growth of bacteria.* If this were the only requirement of an antiseptic, it would be satisfied by a large number of chemical substances. We are accustomed to test the efficiency of antiseptics *in vitro* and conclude, if results are satisfactory in the test tube, that similar results will be obtainable *in vivo.* The history of septic wound treatment is a record of hopes raised by test tube results, and dashed by actual experiences in treatment, either because the agent used was too toxic, or because neutralization by the proteids of the cells and secretions rendered it inert. The constant unsuccessful search for an efficient intestinal antiseptic illustrates the difficulty of this problem.

The human body is made up of cells, which consist of cytoplasm and nuclear material, corresponding closely in composition to the substances making up the bodies of bacteria. These substances are injured equally in cell and bacterium when harmful agents are applied. Germicides act by abstracting water and then coagulating the cell cytoplasm, and act in this manner not only on the bacterium, but also on the cell.

Therefore a second requirement of an antiseptic is:

2. *It must not injure cells.*

The cells are bathed in lymph, which may give them some protection from the antiseptic, while the bacteria, if free, suffer. Bacteria in wounds, however, become quickly bathed in the wound secretions and may invade the cells or lymph spaces between them. It is conceivable that the union of cells in masses may lead to mass protection, and that the cells may interact by their secretions to protect one another, while the unicellular bacterium suffers from its isolation.

The most successful antiseptics are used in very dilute solutions, whose active agents are rapidly neutralized and rendered inert by organic union with the proteids of the wound secretions on contact. They must be applied in such a way that new and new relays of the active agent are being constantly supplied to the surface of the wound. In this way the mechanical removal of the wound secretions, and the exposure of tissue cells and bacteria by the washing action of the menstruum used, is added to the antiseptic effect of the active agent. Antiseptics of this type represent an effort to do a minimal amount of harm to the cells, with a maximum effect on the bacteria. Their application requires some chemical expertness, the use of more or less cumbersome apparatus, and a development of technic not always possible at the front under present war conditions. Moreover, results of their use are not always satisfactory.[11]

We are prone to forget, in our study of antiseptics, that the human body, after all, heals septic processes oftentimes by its own powers, without the aid of antiseptics, particularly if free drainage is established. Sometimes it accomplishes this even in the face of meddlesome antisepsis. We forget that what we call asepsis does not indicate complete freedom from bacteria. It is recognized that perfect disinfection of the skin is practically impossible. Nobody believes that a part of the peritoneal cavity, exposed for a long period during operation, remains absolutely free from bacteria. Aseptic practice is successful because the dosage of bacteria is cut down to the minimum, and the natural defenses take care of the rest.

If we consider the natural defenses as agencies in the protection of wounds, it is evident that we must add another specification to the requirements of an ideal antiseptic.

3. *Its action must not be harmful to the natural wound defenses; rather it must serve to increase their efficiency.*

Wright[12] and others have recommended the use of hypertonic saline solutions for the purpose of drawing lymph and other secretions to the wound surface. Sodium citrate solutions have also been used to prevent clotting of the wound secretions. These agents furnish unsatisfactory test tube (carbolic coefficient) reactions against bacteria, but experience in their use apparently justifies claims as to their value.

An additional requirement of a practical *war* antiseptic is that:

4. *The technic of its application must be simple and require little or no apparatus.*

This needs no discussion.

Practical considerations make it also desirable that the agent used be easily obtainable in quantity and inexpensively.

HOW DOES SERUM SATISFY THESE REQUIREMENTS?

(The numbers refer to the antiseptic requirements previously laid down.)

1. Freshly drawn normal serum has bactericidal properties, dependent upon a labile antisubstance, which, moreover, is easily saturated and rendered inactive. In this respect it resembles the weaker antiseptic agents. After being rendered inactive, it may serve as a culture medium, particularly for a group of serophilic saphrophytic bacteria. It is not a good culture medium, except in dilution, for the pus-producing bacteria. Beef serum exhibits little, if any, bactericidal action against the pyogenic staphylococci. When used under conditions corresponding as closely as they can be approximated *in vitro* to wound conditions, its powers to aid in the killing of bacteria are more evident (opsonins), but even then its action in the test tube is not adequate to account for the results obtained in practice. Heating to 56° C. destroys its natural opsonic activity, so that this element is removed from discussion, with reference to its practical use. Efforts to study the possible interaction of beef serum with human serum and leucocytes are unsatisfactory *in vitro*, because clotting of the mixture arises, unless the leucocytes obtained from citrated blood are washed free from all traces of plasma, and so placed under artificial conditions. In other words, it is impossible in test tube experiments to reproduce the actual relations of beef serum, human lymph or serum, leucocytes and bacteria as they occur in wounds. Some ingenious procedure such as Wright[12] has devised for studying the anti-bacterial power of wound secretions may ultimately solve the problem. At present, however, we are thrown back upon the leucocytogenic powers described by Petit[13] (*vide infra*) to account for the activities produced by the application of normal serum.

2. A substance which can be used to cultivate tissue, even of an alien species, outside of the body (Lambert and Hanes, *l.c*), should not do harm to tissue cells. The application of beef serum to wound surfaces, particularly where the surface was large, in our cases (see Paper VI, this series) was accompanied, according to the testimony of patients, by a soothing sensation of comfort which continued. The best evidence of the bland character of serum is supplied by Case 61, Paper VI. Many unsuccessful attempts have been made to cover in granulating surfaces by the implantation of plucked hairs. The small amount of epithelium from the hair follicle, which adheres to the root of the hair, usually quickly succumbs to the sepsis which arises from the bacteria which are also implanted with the hair. An agent which cannot only control the sepsis, but also favor the growth of the epithelium, cannot be harmful and must possess antiseptic properties. (It will be noted that this case was treated as an outpatient.)

3. While our use of beef serum on wounds is the first recorded, the literature discloses a series of papers by French writers, largely by Raymond Petit,[9] on the use of horse serum in sepsis.

USE OF HORSE SERUM IN SEPSIS.

Petit's experiences, extending over the period since 1901, led to the production of a book[13] on the subject, which is prefaced by a warm commendation by Metchnikoff, under whom Petit had worked. Influenced by the search for leucocytogenic agents stimulated by Metchnikoff's studies in phagocytosis, Petit, having demonstrated that a defensive leucocytosis would be established in the peritoneum of the guinea pig following the introduction of heated horse serum, began its use in human therapy. It is impossible adequately to review his splendid work here. Suffice it to say that he has used heated horse serum successfully in the treatment of several hundred cases, embracing all of the conditions met with in general surgical, gynecological and obstetrical practice. It is his custom, even in clean operations, to leave 20 cc. of horse serum in the peritoneal cavity before closing the abdomen. He reports that he has never seen evidences of anaphylaxis, although the serum has been used in doses of 20 cc. or more, in both pleura and peritoneum, and although the intervals between applications of the serum have extended in some cases to months.

In an appendix* he advocates the use of horse serum in war surgery, and records 11 cases, mostly of fetid septic wounds, several with gangrene, with good results.

The lack of horses available for the production of serum under present circumstances in France, is probably responsible for the limited use of this agent in war sepsis. Even under ordinary circumstances horse serum obtained from stabled animals, which are kept only for its production, is expensive.

NON-SPECIFIC REACTIONS.

Recently much attention has been given to a non-specific reaction which follows the introduction of various proteid and other substances into the body, as a means of stimulating or awakening the slumbering, protective machinery to respond, not in a specific fashion to the proteid injected, but in a general manner. In vaccine therapy it has long been recognized that injections of bacterial vaccines could be followed not only by a specific response to the injected bacteria, but also by a more general response in the form of improvement in associated processes, not due to the specific organism. The constancy with which injections of Staphylococcus Aureus vaccine are followed by a feeling of well-being, and a disappearance of symptoms due to associated chronic processes, is an example in point. The successful treatment of many cases of hay fever due to vegetable proteids, by the use of bacterial vaccines, should be mentioned.

The work of Shafer in the treatment of infections by the intravenous injection of various bacterial proteids was given little attention by scientific investigators in this country, in part because of the frankly non-specific character of the reactions sought (notably by the mixed proteid preparation); in part because of the method of its introduction here; and also because of the dangerous reaction to which the method sometimes gives rise. German investigators recognized, however, that a new therapeutic procedure had been discovered, and have developed a school of what is known as "febrile therapy." For the rather extensive literature on the subject, the reader is referred to the papers of Jobling and Peterson[14] and Miller.[15]

The early work deals with attempts, successful in a considerable percentage of cases, to produce a critical termination in typhoid fever by intravenous typhoid vaccine. Later Kraus[16] obtained similar results with B. Coli vaccine in typhoid. The success of this and other non-specific agents led to the use of various proteid substances, including horse and fowl sera, milk, proteoses, and also non-proteid agents in the treatment of low-grade infections, particularly rheumatoid arthritis. Intravenous injection has been practised by most investigators, but much work has been carried out in Germany with sterile milk, injected into the glutei.

The injection is followed, within a few hours at most, by chills and a febrile reaction, whence the name "febrile therapy." Most authorities agree that a febrile reaction has a favorable influence on infection. Winslow, Miller and Noble[17] have shown that lower temperatures would seem to retard the formation of antibodies. That a febrile reaction is not necessary, is claimed by Friedlander,[18] who treated trachoma by gluteal injections of milk, and obtained good results with only slight increase of temperature. It is generally accepted, however, that a febrile reaction is an essential element in the treatment.

The reaction is accompanied by a transitory leucopenia (due to polynuclear reduction), followed by a leucocytosis, which in Miller's cases sometimes reached 100,000 or more, but as a rule ran from 15,000 to 20,000.

Because of the violent reactions produced, this treatment is contraindicated in patients with hypertension, marked valvular lesions or myocardial changes, in alcoholics and in pregnancy.

This method of treatment has been reviewed at some length here because a non-specific proteid reaction may account *in part* for the results obtained with normal serum therapy. That Petit's results are not due to a febrile reaction is indicated by a study of his cases. No such reactions as are usual in febrile therapy are recorded. He believes, and the evidence justifies his belief, that his results are due to the production of a local leucocytosis at the point of application of the serum, which is accompanied by a greater or less general leucocytosis, depending upon dosage and the opportunity for absorption. There can be no question from our own experience, that on an inactive wound surface, the application of serum is followed within 24 hours by a change in the character of the wound secretions. In indolent processes, an acellular serous discharge containing large numbers of bacteria may be replaced by a sero-purulent fluid in which leucocytes in active phagocytosis are abundant. This reaction was a source of embarrassment to us in our early application of serum. The surgeon, who saw a relatively clean-looking indolent ulcer replaced by a suppurating surface in 24 hours, often concluded that the method was valueless and ordered an immediate change in treatment. The delivery of fresh leucocytes to the surface results in rapid destruction of the bacteria by phagocytosis. As the need for leucocytes decreases, the surface of the wound becomes drier and the secretions become serous. Granulations are promptly established, and the indolent surface becomes a fresh, rosy granulating area, ready for grafting.

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* The publication of Petit's book was delayed on account of the beginning of the war. This delay evidently permitted of the addition of a short appendix on war sepsis.

ASEPTIC RATHER THAN ANTISEPTIC TREATMENT OF WAR WOUNDS.

Bad results may follow the use of antiseptics in fresh wounds, due either to harmful chemical action on the exposed cells, or, in the case of the watery antiseptics, the dilution of the wound secretions or their removal by the washing effects of the fluid. For this reason, modern practice is tending more and more strongly in the direction of the abandonment of antiseptic agents, unless a wound be frankly septic. After the removal of foreign bodies and dead tissue, and the cleansing of the surfaces, the wound is immediately closed, where possible.

The standard French practice, growing in favor with the English R. A. M. C., under the stimulating advocacy of Sir A. E. Wright, is to place in the wound, before closure, hypertonic saline solution for the purpose of stimulating the wound defenses.

This procedure depends wholly for its success upon the natural defenses of the individual, the only extraneous agents used being applied for the purpose of stimulating these defenses. In other words, it consists in the practice of asepsis rather than antisépsis, and its outcome bids fair to accomplish as much for progress in the treatment of fresh wounds as aseptic practice has done for elective surgery.

Normal serum lends itself to use in this connection as the ideal agent. Its application attracts to the surface of the exposed tissues, not so much the serum which is drawn to the surface by the lymphagogic action of hypertonic saline, but particularly the more powerful defenses of the first line, the leucocytes. The superiority of normal serum to salines as a leucocytogenic agent was demonstrated many years ago, when the search for these agents was most active (*cf.* Petit[17]). In addition, serum stimulates and feeds the cells needed to bring about the repair of the wound (the second line of defense) as no other agent we possess (see Paper VI).

4. The simplicity of the technic described in Paper VI makes it evident that the application of serum could be carried out under war conditions without difficulty, even in dressing stations at the front.

THE SUPPLY.

The supply of blood serum from domestic animals slaughtered for food purposes is almost limitless. Blood is at present used for blood pudding, for the manufacture of buttons, and also for some purposes by dye manufacturers. The great mass of it, because of its nitrogen content, is used in the production of fertilizer. For all of these uses the solid portions of the blood—corpuscles and fibrin in the form of clot—are apparently the important elements. The serum, which is relatively poor in proteids, is essentially a waste product, apart from the limited amounts used for culture media and physiological experiments.

PRECAUTIONS IN ITS PREPARATION.

Serum to be used in human therapy should be passed through bacteria-proof filters, without reference to the manner of its collection.

The possible occurrence of foot and mouth disease in domestic animals, including the horse, makes the heating of serum desirable. The virus of this disease passes bacteria-proof filters,[19] but is destroyed by exposure at 50° C. for 10 minutes.[20] A temperature of 56° C. for one-half hour removes from beef serum its toxic properties for laboratory animals,[21] and does not apparently influence its therapeutic properties in man.[22] Beef serum should, therefore, be exposed to a temperature of 56° C. for at least one-half hour. Penna, Cuenca and Kraus[23] exposed the beef serum which they used in the treatment of human anthrax to 56° C. twice for one-half hour. (See Paper IV.)

CONCLUSIONS.

When to the antiseptic properties which it possesses, or provokes by its presence, we add its power to control hemorrhage, and its stimulating and nutritive qualities for the cells needed in repair, there can be little question of the desirability of the serum of slaughtered healthy food animals in the treatment of wounds. The material is abundant, and the technic of its application is simple.

REFERENCES.

[1] Zeitschrift f. Hyg., 1888, iv, 353.
[2] Centralbl. f. Bakt., x, 817; xii, 76; Arch. f. Hyg., x, 727.
[3] See Wright, Studies on Immunization. London: Constable, 1909.
[4] Am. Jour. Physiol., 1916, xl, 366.
[5] Hammarsten and Hedin. New York: Wiley, 1915.
[6] Jobling and Petersen: Jour. Exp. Med., 1914, xix, 459.
[7] La Tribune Médicale, Jan. 12, 1907.
[8] Lambert and Hanes: Jour. Exp. Med., 1911, xiv, 129.
[9] Compt. Rend. Soc. Biol., 1901, liii; Ann. de l'Inst. Pasteur, 1904, Juin; Rev. d. Gyn. et d. Chirurg. Abd., 1904, Août.
[10] Paton: The New Serum Therapy. New York: Wood, 1907.
[11] Editorial BOSTON MEDICAL AND SURGICAL JOURNAL, Sept. 6, 1917.
[12] Brit. Med. Jour., 1915, ii, 674, 717.
[13] Les Phagocytes en Chirurgie. Paris: Masson, 191.
[14] Jour. A. M. A., 1916, lxvi, 1753.
[15] Jour. A. M. A., 1917, lxix, 765.
[16] Wien. klin. Woch., 1915, p. 2, and Münch. med. Woch., 1914, lxi, 1967.
[17] Proc. Soc. Exper. Biol. and Med., 1916, xiii, 93.
[18] Wien. klin. Woch., 1916, xxix, 1321.
[19] Loeffler and Frosch: Cent. f. Bakt. Orig., 1898, xxiii, 371.
[20] Siegel: Cent. f. Bakt. Orig., 1910, lvii, 68.
[21] Nicolle and Césari: Jour. d. Physiol. et d. Path. Gén., 1914, xvi, 4.
[22] See editorial, Jour. A. M. A., Sept. 30, 1917.
[23] La Prensa Medica Argentina, Dec. 30, 1916, and Feb. 10, 1917.

THE PREPARATION OF BLOOD SERUM FOR USE.

STUDIES IN SERUM THERAPY. III.

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and
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[From the Laboratories of Pathology and Bacteriology, Tufts College Medical School.]

The most difficult problem in the preparation of blood serum is its filtration. The finer unglazed porcelain (Pasteur-Chamberland) filters may be used to produce small quantities of serum for laboratory purposes, but are so slow that they cannot be used for production on a large scale.

Diatomaceous earth (Berkefeld) filters were used in our early work. The larger Berkefeld candles are expensive, and are so worn in the necessary abrasion of the plugged outer layer in cleansing after use, that they become too thin to be depended upon after a limited use—in other words, they are short-lived. Because of the expense, it became apparent that some cheaper system of filtration, with greater capacity, should be developed.

We endeavored to produce filtration by passing serum through a prepared bed of diatomaceous earth by suction, but it was impossible to hold the filter bed intact.

Through the courtesy of Drs. A. Parker Hichens and John Reichel, of the laboratories of the H. K. Mulford Company, we were enabled to become familiar with the procedure by which they were filtering hog-cholera serum. This consisted in placing a bed of diatomaceous earth in a pressure chamber over layers of hard and soft filter paper. Air pressure above the serum drove it through the diatomaceous earth and produced filtration.

On this basis the International Instrument Company made for us a pressure filtration chamber of manganese bronze, aluminum lined. The results were good, but were not constant. The layer of earth tended to crack, or leakage occurred along the sides or beneath the layer of filter paper.

Diatomaceous earth tends to expand under steam sterilization, and when placed under pressure, or even when cooling, will crack. For over three years we have tried to overcome these difficulties, but only within the present year have we been able to obtain constantly satisfactory results.

Innumerable combinations of the various grades of diatomaceous earth have been tried to overcome cracking, and all sorts of fittings to do away with the leakage. Asbestos, which seemed ideal for filtering purposes, was discarded because of its hemolytic properties. The procedure which we use today is economical (the earth used in the bed can be washed, sterilized and re-used) and efficient.

It is necessary that the pressure within the chamber be maintained at a constant level during filtration, otherwise cracks arise. The filter bed is one inch in thickness, and a greater output is possible in a single filtration than with the thin-walled filter candles. A reservoir of serum, under the same pressure as the contents of the filtering chamber, is now in use to furnish a fresh supply as the level in the filtering chamber lowers.

TECHNIC.

Blood is obtained under what are known as food conditions, *i.e.*, the method used in collecting blood for blood pudding. The blood of sheep is collected by so-called table killing, the animal being held on a table in such a way that the blood is collected free from danger of contamination by mouth secretions or by the excreta. Beef blood is collected, after the animal has been knocked and swung, from the incision through the great vessels.

Under present methods of slaughtering, it is impossible to collect pig-blood without contamination. No pig blood is used for food purposes in this market, and we have, therefore, no experience in its use.

The blood is received in clean glass vessels (battery jars). Each vessel is immediately covered with a close-fitting aluminum cover and set aside to await the post-mortem inspection of the animal. If evidence of disease is found by the inspector from the U. S. Department of Animal Industry, the blood is discarded.

The jars containing blood from healthy animals are placed in the "cooler" of the abattoir and kept at a temperature of from 36° F. to 40° F. for from 14 to 22 hours. Ths serum is pipetted off and poured into eight-quart milk cans, in which it is transferred to the laboratory. From this time it is handled wholly in rooms set aside for this purpose. On its arrival at the laboratory, dry sterile diatomaceous earth is poured into the cans, to carry down suspended particles as it settles. The supernatant serum is pipetted or poured off as needed.

Filtration is started promptly and continued until all of the "catch" of serum is exhausted. The pressure filter chamber measures approximately 11 inches in diameter and 10 inches deep; is guarded at the bottom by a flush perforated aluminum disk; has connections for steam and compressed air; and is closed at the top by a heavy steel, gasketted cover, held by 18 bolts. The chamber is surrounded by a water jacket for cooling after sterilization.

The filter bed is made by placing in the bottom of the chamber a circular disk of heavy unbleached cotton sheeting held firmly to the bottom and sides by interlocking aluminum rings. On this is poured a suspension of a mixture of "crude" infusorial earth and a refined grade, classed as "medium" (No. 55, Howe and French, Boston), in the proportion of 250 grams of crude and 150 grams of medium. By vol ume the crude is about 70% of the mixture, and the medium 30%. The cover of the chamber is then bolted into place, and direct steam from the power plant is turned into the chamber, and allowed to run at 15 lbs. pressure for 20 minutes after the appearance of steam at the outlet of the filtering apparatus.

When the chamber has cooled sufficiently, a normal saline suspension of infusorial earth of the same composition as that first used (previously sterilized in the autoclave for 45 minutes at 15 lbs. pressure) is poured through an opening in the cover by means of a sterile funnel. Washing effects of this layer are prevented by a guard suspended beneath the opening through which it is poured. The purpose of this second layer is to fill in any cracks which may have been produced during the sterilization and cooling of the first layer. The combined layers make a bed about 2.5 cm. (1 inch) in thickness.

After the second layer has had time to deposit, the chamber is filled with serum. Sterile containers are connected with the outlet, and compressed air is admitted from a tank, whose pressure is about 265 lbs. The normal saline which is contained in the infusorial earth is first delivered. There is surprisingly little mixture of the saline and serum, the effluent being clear and watery until practically all of the introduced saline has escaped. Allowance is made for slight dilution of the first serum output, which is discarded.

The sterile serum is collected in gallon bottles, and from these pumped by sterile air into 20-ounce amber bottles, which are covered by a tight-fitting rubber cap, and guarded by an outer paraffin paper dust cap, which covers the neck. It is subjected in these bottles to a temperature of 56° C. for one-half hour.

While repeated tests have shown the sterility of the output as received from the filter, the further handling of the serum, although closely guarded, leads frequently to its contamination. Producers of serum for therapeutic purposes have met with this difficulty also, so that it is customary to add small quantities of antiseptics to keep down growth. Tricresol is usually added in .3% strength, but has become impossible to obtain on account of the war. The Massachusetts Antitoxin Laboratories use chloroform. We add to the serum .3% carbolic acid.

ANAPHYLACTIC REACTIONS TO NORMAL SERA.

Studies in Serum Therapy. IV.

By Timothy Leary, M.D., Boston,
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and
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Anaphylaxis has been the bogie man of the serologist because of the usually fatal shock which appears in a susceptible guinea pig, following the injection of a proteid to which the animal has been sensitized, and because the term "anaphylaxis" is a misnomer.

Anaphylaxis (literally "without protection") was the term applied by Richet,[1] its discoverer, to the reaction which can be produced by injecting an antigenic (proteid) substance into an animal in a so-called sensitizing dose, and, after an interval of 8 to 14 days, introducing a second so-called toxic dose of the same proteid. In the guinea pig, death frequently follows the second dose. Autopsy discloses an over-distention of the lungs with air, due to spasm of the unstriped bronchial muscle, which throws the bronchial mucosa into folds, thus completely occluding the finer air passages. Death is due to asphyxiation by lack of exchange of air.

The secondary bronchi of the guinea pig are much more richly supplied with unstriped muscle than are those of the domestic animals or man, in whom the above described respiratory phenomena are rare.

In man, Rosenau and Anderson[2] were able to collect only 19 cases of fatal anaphylaxis, following the use of horse serum in diphtheria. The number of fatal results is so small in comparison with the number of individuals in whom diphtheria antitoxin has been used that it is difficult to estimate the percentage, which is an extremely minute fraction of one per cent.

The fatal cases in man have occurred almost wholly in individuals who were sensitized to horse proteids and most of whom suffered from asthma, presumably also arising from horse proteid sensitization. Repeated attacks of asthma, it is believed, lead to an hypertrophy of the bronchial muscle, analogous to that found naturally in the guinea pig.

In addition to the immediate general (shock) type of anaphylaxis, there may be exhibited prompt (within 24 hours) local effects at the point of inoculation, marked by edema and perhaps necrosis (Arthus phenomenon).

Delayed reactions to the injection of foreign proteids appear 8 to 14 days after the introduction of the proteid into the body, and constitute what is known as "serum sickness." The characteristic symptoms are local redness and itching at the point of injection, general urticarial rashes and, in severe cases, more extreme general reactions, joint pains, sometimes with effusion, gastrointestinal disturbances, etc.

Apart from the examples of food anaphylaxis (egg poisoning, the food urticarias and so-called indigestions) practically all of the serious effects of anaphylaxis observed in man, under treatment, have arisen from horse sensitization and have followed the use of horse serum. These effects can be prevented by the recognition that asthma may indicate horse sensitization, and by the careful administration of less than toxic doses of horse serum, where any doubt exists as to the anaphylactic state of the individual.

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* Deceased.

Through the concentration of diphtheria antitoxin and the observation of the precautions mentioned above, serious accidents following the use of horse serum are practically unknown today.

The term "anaphylaxis" (without protection) is a misnomer because the condition so termed is one of increased protection. The individual is hypersusceptible because the first injection of proteid has led to the formation of antibodies, or because of a hyperpreparedness of his immunizing machinery to cope with the second injection. The result of the introduction of the second dose may be an explosive reaction due to the sudden breaking up of the foreign proteid when it meets the antibodies, or it may be, as Novy[3] expresses it, "the result of anaphylotoxin production *in corpore,* consequent upon the inducing action of a body which is formed by union, or otherwise, of antigen and its specific antibody."

Anaphylaxis due to infection is recognized in the tuberculin and mallein tests. The normal individual does not react to these tests because he has no susceptibility to the agents introduced,—in other words, he has no antibodies. The infected individual reacts because his blood contains antibodies; because he has an immunity, though perhaps of insufficient degree to overcome the infection. Specific anaphylaxis, then, is a reaction of immunity.

Until recently we have believed that the phenomena of anaphylaxis were always exhibited against specific proteid bodies, *e.g.*, that the horse-sensitized individual would react only to horse serum proteids, etc. Recent work, however, notably that of Novy and his co-workers, has indicated that other substances, even distilled water, may serve as the means of releasing the shock-producing agencies, which have arisen in sensitized animals as a result of the first dose of a specific antigen.

That anaphylaxis may be a useful reaction is indicated by the experience of Smith.[4] He treated gonorrheal complications with antigonococcic (horse) serum, and observed that improvement or cure was obtained only when an anaphylactic response occurred, and that the degree of improvement corresponded to the severity of the reaction. He was led by these observations to use normal horse serum in the treatment of a second series of cases, with results as good as those obtained with the specific serum, and concludes that whatever virtue lies in antigonococcus serum depends, not upon the antigonococcal elements, but on the horse proteids.

More or less related to the specific proteid reactions are the non-specific responses to injections of proteids, which are being used widely today in the treatment of low-grade infections, and which apparently act by stimulating the protective machinery which has been quiescent or inefficient. (See Paper II.)

In preparation for the use of animal serum in the treatment of wounds we expected to use sheep serum as our main supply. Rogers and Beebe[5] report several thousand injections of sheep serum in human beings. In 95% there followed an area of hyperemia and slight induration at the site of the injection. Occasionally the whole arm became edematous. In a large percentage of cases there was no general reaction, in spite of the fact that the serum was used in cases of exophthalmic goiter, in which nervous and cardiac unstability are marked. A few severe general reactions, coming on shortly after injections, were met with. No mention is made of the delayed reaction so familiar after horse serum. Commercial houses are now supplying sheep serum to be used for the control of hemorrhage in horse-sensitized individuals, where anaphylaxis is feared.

War conditions made the local supply of sheep serum irregular and inadequate.

We approached the use of beef serum, the main alternative, with trepidation. It was a matter of common knowledge to laboratory workers that beef serum was toxic for guinea pigs and rabbits, its injection in large doses being followed by death, and smaller doses resulting in local edema and necrosis. Nicolle and Cesari[6] have demonstrated that heating beef serum to 55° C. for one-half hour removed its toxicity.

The omnivorous human being, unlike the herbivorous guinea pig and rabbit, includes beef and beef products as constant articles of his diet, and theoretically should be in a state of constant anti-anaphylaxis with reference to beef proteids.

The literature furnished no indications, however, of the successful use of beef serum in human beings, other than by mouth (Paton).[7]

We, therefore, decided to carry out a series of skin tests on normal human beings, in order to determine human susceptibility to the local application of various animal proteids. This method seemed particularly applicable, first, because it was recognized that the toxic character of beef serum is exhibited in non-fatal doses in laboratory animals at the point of inoculation; and secondly, because in wounds the serum would be applied in most cases locally.

TECHNIC.

The early tests were made by producing a small circular abrasion of the skin with a watchmaker's screw driver. This method led to excessive traumatism of the skin in many cases. A sterile toothpick rotated between the fingers (broad end in contact with skin) tended to produce too great or too little traumatism, much depending on the edges of the toothpick and the rapidity with which the wood imbibed fluid

Satisfactory results were finally obtained by scratching the skin with the edge of a watchmaker's screw driver.

A ruler was placed against the outer side of the arm and single scratches were made outward from the edge of the ruler on alternate sides, one inch apart. This resulted in a separation of two inches between adjacent scratches on either side of the ruler. The proteid substances were applied to the scratches by means of sterile toothpicks. Aseptic precautions were used. In a few individuals with hypersensitive skins, welts (dermographia) appeared about all of the scratches. In the mass, however, the results were readable and relatively satisfactory.

The substances used in the test were:

1. Normal saline solution (control).
2. Human serum.
3. Beef serum.
4. Sheep serum.
5. Pig serum.
6. Fowl serum.
7. Rabbit serum.
8. Goat serum.
9. Horse serum.
10. Egg white (diluted 1-10).
11. Milk.

The sera and milk were fresh, undiluted and unheated. Tests were made in 113 individuals.

RESULTS.

REACTION	SLIGHT	MODERATE	MARKED
Human	2	2	0
Beef	14	17	2
Sheep	10	9	2
Pig	19	17	0
Fowl	21	25	4
Rabbit	20	15	2
Goat	16	14	2
Horse	16	15	2
Egg white	23	17	2
Milk	14	16	3

Some individuals gave skin reactions to most of the agents used, excepting the saline and human serum.

The occurrence of a reaction to human serum in a small number of cases is interesting, but agrees with the finding of isolysins in human and other sera. Although precautions were taken to make the scratches as nearly alike as possible, an error from this source, due to variation in the traumatism, cannot be excluded.

Notable is the grouping of the other sera, excepting that of the fowl. It will be observed that the reactions to beef, sheep, pig and goat sera correspond, within the limits of error, to those obtained with horse serum.

Chicken serum and egg white gave a high percentage of reactions, as would be expected from the recorded cases of egg poisoning.

In recent literature Penna, Cuenca and Kraus[8] "conclude their report of the excellent results obtained in anthrax or malignant pustule by intravenous injections of normal beef serum. At first they used prepared immune serum, but found to their surprise that normal beef serum was fully as effectual. All the fifty cases given the treatment promptly recovered. These results in the clinic corroborate the assertions of Kraus and Beltrami,[9] to the effect that normal beef serum protects rabbits against malignant pustule just as effectually as the immune sera. In the clinical cases the injection was made intramuscularly or subcutaneously in 18 cases, and the curative effect was equally pronounced. Among the typical cases described is that of a man employed in a slaughtering house to remove hides of the cattle. A small itching pimple developed on the left wrist, which rapidly spread, and in five days had become transformed into a malignant pustule, the arm swollen, with high fever and pulse of 130. He was given two subcutaneous injections of beef serum, a total of 60 cc., the fifth and sixth days, and improvement was evident in two days. By the thirteenth day he had quite recovered, except that the glands in the axilla were still enlarged. The anthrax bacillus was cultivated from the vesicles." (Review; *Jour. Amer. Med. Assn.*) The *Journal of the American Medical Association* comments editorially[10] on a later, evidently unpublished, report of the treatment of 90 additional cases, with one death. The normal beef serum used was heated to 56° C. twice for one-half hour. No anaphylactic reaction appeared save slight local swelling in two cases.

Dr. Edwin Place, physician in chief, South Department, Boston City Hospital, in a personal communication of unpublished work, states that in preparation for the use of antitoxin in individuals who were known to be hypersusceptible to horse serum, he carried out a series of injections (1 to 10 cc. in arm or back) of antitoxic beef serum in over one hundred cases.

Practically 90% of the cases exhibited a local reaction marked by the appearance within 24 hours of redness, swelling and tenderness about the site of the injection. This, though oftentimes extensive, subsided in all cases without local after-effects in two or three days. None of the children exhibited any other anaphylactic reaction, *i.e.*, the reaction was purely local, in no case becoming generalized. This is in contrast to the reaction to horse serum, which, when it occurs, is usually delayed and general, marked by urticarias, etc.; rarely is there exhibited a purely local reaction. The antitoxic effect, as was to be expected, corresponded to the effect of using antidiphtherial horse serum.

CONCLUSIONS.

The results of our observations indicate that the skin reactions to unheated beef serum correspond closely to the reactions obtained with the sera of the other higher domestic herbivora, including the horse.

The work of Dr. Place justifies a belief that beef serum, unheated, has only minor local toxicity, if any, in human beings, and can be used from this standpoint almost as safely as can horse serum. The observations of Dr. Place indicate that beef serum is safer than horse serum with reference to delayed anaphylactic responses, which follow so frequently the use of horse serum.

The clinical application of beef serum in the treatment of wounds has been followed by no anaphylactic phenomena when the serum has been applied to wound surfaces.

In six cases injections of serum were made, either subcutaneously or into the deep tissue. The amount injected was about 15 cc. In three of these cases chills occurred within two hours of the injection. In only one case was the chill marked, the temperature reaching 103.

In no case did a delayed anaphylactic reaction appear.

REFERENCES.

1 Compt. Rend. Soc. Biol., Paris, 1902.
2 Preventive Medicine, etc., Rosenau, New York, 1913.
3 Novy and DeKruif: Jour. Inf. Dis., xx, 6, June, 1917.
4 Jour. A. M. A., June 3, 1916, p. 1758.
5 Arch. Int. Med., 1908, ii, 297.
6 Jour. de Phys. et de Path. Gen., xvi, 4, 1914.
7 Paton: New Serum Therapy. Wood: New York. 1906.
8 Prensa Medica Argentina, Mar. 10, 1917, reviewed in Jour. A. M. A., 1917, 1589.
9 Prensa Medica Argentina, 1916-17, iii, 225.
10 Jour. A. M. A., Sept. 30, 1917.

A CASE OF STREPTOCOCCUS MENINGITIS SUCCESSFULLY TREATED WITH NORMAL (HUMAN) SERUM.

Studies in Serum Therapy. V.

By Francis P. McCarthy, M.D., Boston.

[From the Pathological Laboratory and Medical Service of St. Elizabeth's Hospital.]

The following case is reported because it is the first case of streptococcus meningitis treated by a normal serum, and because of the rarity of records of the successful outcome of any form of treatment in this condition.

A search of the literature discloses 9 reported cases of recovery in which streptococci were found in the lumbar puncture fluid.

Alexander[1] reports meningeal infection, due to middle ear disease, in a case which recovered following opening of the vestibule, incision of the dura and drainage.

Netter[2] reports recovery in meningitis secondary to double otitis media in a child. The treatment in this case included spinal puncture, warm baths and the intravenous injection of collargol.

Tedesco[3] reports a case with undisclosed origin, which recovered following repeated lumbar punctures.

Du Bois and Neal[4] report recovery in meningitis secondary to otitis media. Treatment consisted in intraspinal and intravenous injection of antistreptococcus serum.

Bryant[5] treated a case, following otitis media, by decompression and local drainage, with the internal use of magnesium sulphate, to combat the toxemia. Death occurred on the 190th day after operation, from infection of the operation wound and encephalitis.

Day[6] reports a meningitis (following mastoiditis) successfully treated by intraspinal use of antistreptococcus serum and an autogenous vaccine subcutaneously.

Leighton and Pringle[7] report the recovery of two cases following otitis media. The treatment consisted in lumbar laminectomy and drainage.

MacKenzie[8] treated successfully a case, following mastoiditis, by incision and drainage of the dura.

The following case was turned over to me for treatment by Dr. Felix McGirr, in whose service it occurred.

A. J. Male, age 25 years, brakeman.

Past History. Patient had an accident while working on railroad July 15, 1916. His head was struck by a bridge and he was rendered unconscious. He was treated at St. Vincent's Hospital, Worcester, Mass., for scalp wound and questionable fracture of skull. He recovered in two weeks, and returned to work in good condition at the end of six weeks.

Present Illness. Oct. 14, 1916. Patient was caught between two freight cars and suffered injuries to his head and chest. He was brought to St. Elizabeth's Hospital unconscious and bleeding from both nares. He recovered consciousness a few hours after entrance, but suffered from shock. The next day he complained of severe frontal headache, dizziness and nausea. Ten days later he complained of pain in the right ear. Examination by Dr. Edgar M. Holmes, showed hearing absent in right ear, bloody crusts in both nares, especially on right side. Interpretation of findings suggests injury extending from ethmoid (cribriform plate) to middle fossa.

Nov. 7, 1916. Patient out of bed, unsteady, rather dizzy.

Nov. 18. Discharged, relieved, returned home. Patient reported at Out-Patient Department for deafness in right ear.

Dec. 14. Patient taken with severe chill and went to bed. A few hours later was found by a member of his family on the floor under the bed, delirious and very difficult to manage. It was necessary to administer ether to the patient in order to get him into the ambulance. Patient actively delirious on entrance, rational only for a few minutes at a time, and complained of severe headache. Temperature, 103.5, pulse 140. Physical examination showed marked rigidity of neck, nystagmus, hyperesthesia, knee jerks very lively, double Kernigs. Cremasteric reflexes exaggerated.

Dec. 15. Patient very delirious. Ether was necessary in order to perform lumbar puncture. 80 cc of purulent fluid escaped under pressure. 20 cc. of normal human serum injected into spinal canal.

Bacteriological examination shows Gram positive diplococci in short chains on smears. Cultures on blood agar show a non-hemolytic organism, whose colonies have a slight greenish tinge. Inulin is not fermented. The organism is, therefore, to be classified as a streptococcus viridans.

Dec. 16. Lumbar puncture, cocaine anesthesia. 15 cc. of spinal fluid escaped under considerable pressure. 15 cc. human serum introduced. Fluid clearer, though still very cloudy, with a slightly yellowish tinge. Smears show polymorphonuclear leucocytes and abundant streptococci. Cultures same as on previous day.

Dec. 17. Lumbar puncture. 40 cc. of purulent fluid escaped under moderate pressure. The fluid was less cloudy. 15 cc. of normal human serum (obtained from the patient's brother) was introduced into the spinal canal.

Dec. 18. Lumbar puncture. 25 cc. of fluid escaped under slight pressure. 15 cc. of normal human serum injected into canal. Patient shows daily improvement and is now rational, but headache persists.

Dec. 19. Lumbar puncture. 30 cc. of cloudy fluid under pressure. 10 cc. of human serum injected. Very few streptococci found in smears.

Dec. 20. Lumbar puncture. 35 cc. of slightly cloudy fluid obtained under slight pressure. 15 cc. of human serum introduced into canal. Patient is now quite normal, taking interest in current events, able to read newspapers.

Dec. 22. Lumbar puncture. 12 cc. of almost clear fluid obtained, no pressure. 10 cc. of human serum introduced. Fluid shows fewer leucocytes on smears and no streptococci. Cultures negative. Temperature has shown a gradual drop to normal.

Jan. 2, 1917. Patient very comfortable, rigidity of neck absent. Kernig present slightly on left, absent on the right. Knee-jerks still exaggerated.

Jan. 12. Patient out of bed, somewhat unsteady, with slightly spastic gait.

Jan. 17. Walking much improved, spasticity disappeared.

Feb. 2. Patient has improved in general health and is now in normal condition, except for deafness in right ear which resulted from the first injury, and antedated the attack of meningitis. Patient discharged from hospital today.

Patient shows no sequelae since discharge from hospital up to date.

The normal blood serum, with the exception of that used in one injection, was obtained from the Obstetrical Department of the Hospital by collection from umbilical cords, under aseptic precautions. This serum was controlled by Wassermann and bacteriological tests before use.

It is our custom to conserve placental blood, which is collected as a routine. The serum is separated, and stored in the Pathological Laboratory for use in hemorrhagic conditions.

REFERENCES.

[1] Alexander: Arch. f. Ohrenheilk., 1908, lxxvi, 1.
[2] Bull. et Mem. Soc. Méd. d. Hôp., 1909, xxvii, 11.
[3] Zentralbl. f. Ohrenheilk., 1910-11, ix, 365.
[4] Archives of Pediatrics, 1915, xxxii, 1.
[5] BOSTON MEDICAL AND SURGICAL JOURNAL, 1914, clxxi, 803.
[6] Surg., Gyn. and Obst., 1913, xvi, 369.
[7] Jour. A. M. A., 1915, lxiv, 2051.
[8] Proc. Roy. Soc. Med., London, 1915, viii, Otol. Sect. 57.

THE TREATMENT OF WOUNDS WITH NORMAL (BEEF) SERUM.

STUDIES IN SERUM THERAPY. VI.

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INVESTIGATION of the value of normal serum treatment of wounds cannot be carried out successfully in animals, because laboratory animals are refractory to infection with the pus-producing bacteria which are active in human beings. Lignieres[1] produced local ulcerations of the thigh in guinea pigs by the injection of attenuated anthrax cultures. These ulcers healed spontaneously, although after considerable delay. Treated with normal horse serum, healing occurred more rapidly than in untreated controls.

The conditions produced by attenuated anthrax cultures are, however, not wholly comparable to the septic wounds which arise in human beings as the result of the activity of the pus producers. Conclusions as to the efficacy of any agent in the treatment of septic wounds must depend, in the last analysis, on the actual treatment of wounds in human beings.

In the application of normal serum to the treatment of wounds, the following technic has been practised:

TECHNIC.

Essential principles in the treatment of open processes with serum are:

1. That when the dressing (gauze soaked with serum) is applied, it should touch every part of the wound, and should be packed into blind pockets with dressing forceps.
2. That the dressing should be kept moist.

For general purposes, dressings of sterile gauze soaked with serum and then placed in contact with the wound, have been applied at four-hour intervals in cases showing large surfaces.

A method which is responsible for greater economy of serum and gauze, and equally successful, consists in moistening the gauze with serum at intervals without changing the dressing. For this purpose an atomizing nozzle attached to the serum bottle has been used.

Where a cavity is present, serum may be poured into the dressing, which is then changed only twice a day. The cavity is irrigated with serum by means of a P syringe, whenever the dressing is changed. Deep sinuses, where intimate contact of the dressing with all parts of the surface is impossible, should be irrigated at more frequent intervals (three hours). In cases of diffuse cellulitis, with through-and-through openings, irrigation is practiced by means of a

P syringe into the rubber tissue or tubing used in the dressing.

In the treatment of burns, dressings are moistened *in situ*, and changed only once a day.

Fresh wounds are cleansed, irrigated with serum, sutured where it is possible to approximate the skin edges, and a serum dressing applied externally. This dressing is not disturbed for three or four days, unless evidences of sepsis appear. Where the edges of the wound cannot be approximated, a serum dressing is applied, kept moistened with serum, and not disturbed until the end of five days, when the wound surface will be found covered with clean granulations.

In compound fractures the skin is cleansed in the usual manner with soap and water, followed by alcohol. If the bone projects, it is cleansed with soap and water, followed by saline, and reduction practised. The wound is irrigated with serum and closed. The serum which remains in the cavity before suturing is not dislodged.

Injections into the deep tissues by means of a Record or Luer syringe, have been practiced in six cases of diffuse cellulitis, where drainage was inefficient, through the multiple openings made. Ten to twenty cc. of serum are introduced into the brawny tissue showing inflammatory edema.

For the prevention of evaporation, dressings with large surfaces may be covered with oiled paper. For the technic of skin grafting, *vide infra.*

The following cases* have been treated:

(The numbers in brackets have been assigned to the cases in our serum records. Op. indicates operation. S.P.A. indicates Staphylococcus Pyogenes Aureus. Flaxseed and chlorinated soda indicate the use of flaxseed poultices, interrupted by 15-minute soaks in hot chlorinated soda solution every four hours. Irrigation refers to serum irrigation. O.P.D. indicates Out-Patient Department. The time of healing or of healthy granulation is recorded with reference to the beginning of treatment with serum.)

A. CELLULITIS.

1. (1) Male, 28. Peri-rectal abscess, dissecting from anus to scrotum, with large sloughing scrotum and several openings. Op., large incisions from anus through scrotum. Under chlorinated soda dressings, scrotum continued to slough. Serum dressings followed by prompt disappearance of sepsis, with granulation in 5 days.

2. (3) Male, 52. Carbuncle of neck, 3 inches in diameter. Op., excision. Clean granulations in five days under serum dressings.

3. (6) Male, 44. Gangrenous scrotum. Op., incisions. Under serum dressings sloughs separated, including a large part of scrotum, and healthy granulations filled in area in five days. Five days later, plastic operation followed by serum dressings. Healed by first intention.

4. (10) Male, 40. Ischio-rectal abscess (left). Op., incision, drainage. Cavity packed with gauze soaked with serum. Irrigations. End of fourth day, cavity filling in with granulations, no pus.

5. (12) Male, 38. Carbuncle of neck, five inches in diameter. Op., excision, packed with iodoform gauze. Next day serum dressings. Discharged on fifth day with healthy granulations. (See also under skin grafting No. 61.)

6. (14) Male, 58. Diabetic. Carbuncle of back. Op., incision and drainage in O.P.D. Admitted to House because of extension. Op., incision enlarged, curetted. Serum pack. Three days later sepsis cleared up, wound strapped.

7. (22) Male, 44. Diabetic. Carbuncle of back. Op., incision in O.P.D. Admitted to House because of extension. Op., excision, followed by alcohol dressing. Dichloramin T dressing for two days. Flow of pus from wound. Serum dressing followed by clean wound in 3 days. Healthy granulations, seven days after operation.

8. (25) Male, 38. Abscess of scrotum (localized, S.P.A. infection). Op., incision, 4 oz. pus. Serum irrigation and dressings every 24 hours. Two days later, slight amount of clear fluid. Discharged to O.P.D.

9. (28) Male, 28. Cellulitis of scrotum. Flaxseed poultices for six days. Op., incision. Serum irrigation and dressing. Slight discharge of pus. Fourth day, clean granulations appearing, edema subsiding. Eighth day edema absent, abundant granulations.

10. (36) Male, 48. Pulmonary T.B. Cellulitis from left knee over leg to mid point. Op., small incision. Eighteen days later, little better under flaxseed and chlorinated soda. Op., opening of abscess cavity by two small incisions, above and below. Rubber tube drainage. Through-and-through serum irrigation. Fourth day pus discharging freely, swelling subsiding. End of two weeks, swelling gone, slight discharge. Eighteen days clean. Discharged to Consumptives' Hospital.

11. (46) Female, 28. Cellulitis of leg five days after wound of knee. Periarticular swelling of knee with femoral glands. T., 102. Flaxseed two days, with extension of process. Op., incision, through-and-through drainage (rubber tube). Serum drip every two hours for one-half hour. Twenty-four hours later, copious pus. Three days later swelling gone, very little pus. Irrigations discontinued. Discharged on seventh day to O.P.D.

12. (81) Male, 8. Ischio-rectal abscess. Op., incision. Abscess three and one-half inches deep. Serum irrigation and wick to depths. Twelve days later clean, filled with granulations.

13. (27) Male, 49. Septic ankle 5 days following sprain. Ten days later op., incision, 4 oz. pus (S.P.A.). Under serum irrigation and dressing, local process cleared incompletely in 8 days, when he showed positive blood culture. Developed pyemia, and died twenty-first day after injury.

B. INFECTED WOUNDS.

14. (4) Female, 6. Crush of foot by street car. Op., Lisfranc amputation, flaps poor. Eight days later flaps sloughing, stitches removed. Serum irrigation and dressing. Five days later flaps still sloughing. Eleven days later clean granulations. (See also skin graft No. 58.)

15. (5) Male, 16 mos. Double undescended testicle. Op., wounds septic, four days later all stitches out. Serum irrigation and dressing. Four

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* Acknowledgment is made to the members of the Surgical Staff of the Boston City Hospital, in whose services these cases have been treated. Thanks are also extended to the House Officers for their coöperation.

days later wounds granulating. Healed on eleventh day.

16. (9) Male, 35. Septic scalp wound, six inches long, six days after injury, periosteum denuded. Side of head swollen and tense with pus. Stitches removed. Serum dressings. Covered with clean granulations in four days.

17. (11) Male, 13. Persistent urachus with cystitis. Op., suprapubic cystotomy. Developed sepsis of wound. Abundant pus. Serum dressings begun 12 days after operation. Pus increased in 24 hours. Sepsis clear in 48 hours. Healed in eight days.

18. (16) Male, 14. Lacerated wound of leg with avulsion of skin (crush). Four days later, slough of flap with sepsis. Four days later, flap removed. Serum dressings begun. Four days later, wound clean, granulating.

19. (17) Male, 54. Inguinal hernia, scrotal abscess. Op., hernia incision. Finger in scrotum disclosed abscess of scrotum. Through-and-through incision. Reduction of hernia abandoned. Under treatment with Dakin's solution 13 days, with little relief. Very profuse discharge from upper wound. From lower wound, discharge fecal in color and odor. Through-and-through serum irrigations and dressings begun. After seven days, induration gone, upper wound clean, slight discharge from lower wound. Wounds healed in nineteen days.

20. (18) Male, 51. Osteomyelitis of finger with septic hand, following blow. Flaxseed and chlorinated soda for 10 days. Op., amputation of finger. Culture, pneumococcus and B. coli. Four days later, open flaps sloughing. On seventh day serum begun, injection about wounds (10 cc.) with dressing. Eighth day after, wound clean, granulating.

21. (30) Male, 45. Traumatic rupture of gall-bladder. Op., repair, with drainage. Sepsis of abdominal wound. Ten days after op. serum irrigations begun. Eight days later wound clean.

22. (35) Female, 18. Septic finger. Op., amputation. Flaps not sutured. Serum dressings. In six days, clean granulations. Discharged O.P.D.

23. (39) Female, 22. Acute appendix. Op., excision with drainage. Twenty days later, persistent sinus with abundant pus. Serum irrigations begun. Six days later, discharge ceased. Wound strapped.

24. (49) Male, 17. Septic lacerated wound of scrotum 5 days after suture. Stitches removed. Serum dressings. Wound clean in two days.

25. (57) Male, 23. Ruptured appendix. Op., excision, 11 days later dissecting sepsis under skin and muscle, wound gaping. Serum irrigation and dressings. Six days later, wound clean, strapped unsuccessfully. Secondary suture on tenth day. Reinfection of wound, seventeenth day. Wound gaped. Serum treatment again started. Six days later, wound clean, strapped. On twelfth day, wound healed solid. (In this case the second strapping was carried out in such manner that serum dressing could make contact through the lacing.)

27. (64) Female, 39. Appendectomy, persistent draining sinus when discharged. Readmitted in four months with chronic abscess of abdominal wall. Op., incision. Serum dressings for two weeks, still draining, though diminished quantity. Chlorinated soda dressings.

28. (67) Female, 26. Foreign body in finger. Op., removal of needle, followed by sepsis in finger and hand. Op., incisions. Flaxseed and chlorinated soda. Serum injection (12 cc.) four days later, followed by dressing. Sepsis in hand cleared up in four days. Finger swollen. X-ray showed osteomyelitis. Refuesd operation and left hospital.

29. (71) Male, 10 months. Mastoid operation. Septic glands of neck, incised. Developed measles. Incision from mastoid over back of neck. Treated with chlorinated soda without success. Four weeks later, serum dressings to foul wound with indolent granulations. In four days, wound clean and almost healed.

30. (72) Female, 12. Finger lacerated by firecracker. Op., amputation. After several days, stump septic with extension to palm. Four months later, septic stump with old granulations discharging pus, and septic wound of palm. Under serum, granulations healthy in 5 days. No pus.

31. (77) Male, 45. Hernia operation, followed by sepsis in four days. Serum dressings. Fourteen days later, wound clean, practically healed.

32. (26) Male, 53. Varicose veins. Op., followed by sepsis in four days along stripper track. Streptococcus and S.P.A. Serum irrigation and dressing. Four days later, track clean. On eighth day, secondary suture of wounds followed by sloughing of stitches, which cleaned up in two days.

32A. (55) Male, 52. Stab wound of abdomen with stick, perforating. Op., exploratory, drainage. No perforation of gut found. Three days, fecal fistula. Serum dressings. In two days, fecal discharge stopped. Slight sero-purulent discharge for 48 hours longer. After 8 days, wound strapped. Healing by first intention.

COMMENT.

Striking, in the treatment of septic conditions, is the rapid control of the sepsis. Wounds once cleared of their sepsis, remain clean under serum applications. Granulations appear earlier than under other forms of treatment and grow with great rapidity. Granulations are recognized as important agencies in the protection of wound surfaces. Their early appearance and rapid spread may account in part for the permanence of the control of sepsis under serum.

The comfortable feeling which patients report after wounds are dressed with serum, and the complete absence of any sensation of irritation, are worthy of comment.

Case 13 died of pyemia, evidently due to bacterial invasion of veins below the wound surface and beyond the possibility of contact with the wound dressings.

In Case 27 no explanation can be offered of the failure of serum, as well as other agents, to control the sepsis. A Wassermann was negative.

C. ACUTE OSTEOMYELITIS.

33. (15) Female, 9. Right tibia S.P.A. Op., trephine, trough produced by removal of necrotic marrow. Wound sutured at ends, filled with gauze soaked with serum. Irrigation twice per day. Purulent discharge slight. Eight days later discharge only from marrow at ends of cavity. Soft tissues have escaped infection. Granulation began in seven days in soft tissues. Fifteen days, abundant granulations. Twenty three days, backing up of pus in marrow cavities at ends. T., 103. Serum

injected into marrow tissue. Temperature terminated by lysis in two days. In 30 days, cavity filled with granulations. Three small pieces of necrotic bone removed. In five weeks, exuberant granulations cauterized. Discharged O.P.D. in six weeks, with small granulating surface.

34. (33) Male, 12. Right tibia. Op., trephine, cavity cleared out, filled with serum. Wicks placed, skin partly sutured. In six days, granulations starting, very small amount of pus. In twenty days, up and about. In twenty-three days discharged to O.P.D. Wound filled with granulation and healing.

35. (60) Male, 49. Tibia. (S.P. Albus, Aureus, diphtheroid bacillus). Op., trephine, trough made, iodoform pack. Two days later serum pack. Ten days later bone covered with granulations. Little discharge except from lower pocket. Fifteen days later X-ray showed pocket beyond operation field. Op., extension two to three inches, pocket cleared out, iodoform pack. Eight days after second op. new wound granulating. Twenty-one days later ready for grafting.

COMMENT.

Under serum, these cases showed much less purulent discharge, and granulations appeared earlier and in greater abundance than under any other form of treatment. The filling of the cavity with granulations, which did away with the cavity as such, earlier than is usual in the average case, converted bed into ambulatory cases, and was an important factor in shortening the stay of patients in the hospital.

D. COMPOUND FRACTURES (SEPTIC).

36 (19) Male, 42. Both bones, forearm. Op., cleansing and reduction. One week later sepsis. Two-inch wound opened, four oz. pus. *Bone showing.* Serum irrigation and pack. Four days later no discharge. Wound granulating. On seventh day granulations filled wounds, all symptoms subsided. Discharged O.P.D.

37 (37) Male, 35. Clavicle (simple fracture). Did not return for treatment until two weeks when septic compound fracture appeared. Alcohol cleansing, iodoform pack. Dakin's for four days, much pus. Serum dressing started. Eight days later slight discharge. *Granulations covered over bone.* Twelve days later wound clean. Discharged to O.P.D.

38 (45), Male, 17. Both bones of leg. Culture S.P.A. Albus B. Coli, Diphtheroids. Op, cleaned and repaired. Three days later septic, seven days later much pus. Hypodermic injection serum 20 c.c. Five days later three injections into tissue, slight general reaction after each. Tenth day, serum irrigation and dressing. Pus from cavity, bare bone. Twenty-two days later granulations, slight discharge. *Bared bone (one-half inch at end) covered in with granulations and did not exfoliate.* Thirty-two days, clean. Forty-three days, healed.

39. (47) Male, 36. Both bones of leg (14 mos.) S.P.A. Three op. since. Old sinuses. Serum injections into walls for four days. Reaction in three hours. T. 100, with chills. Serum irrigation. Thirty-four days later one sinus healed, other discharging pus. Op., fragment of dead bone one inch in greatest diameter removed. Healed under Carrel-Dakin.

40. (48) Male, 33. Both bones of leg. Op., cleaned and repaired. Healed. Three and one-half weeks later open reduction and wiring for position. Twenty-five days after op. sepsis. Twenty c.c. serum injected into tissue. Moderate chill. Temperature 99. Serum dressings. Nine days later wound clean. Thirteen days healed.

41. (69) Female, 24. Both bones of forearm. Op., cleansed and repaired. Three days later sepsis. Seventh day serum started. Four days later serum dressings changed to Dakin's. Clean in seven days. Granulation.

COMMENT.

In Case 38, naked bone covered in with granulations and did not exfoliate. In Cases 36 and 37, the periosteum covering exposed bone was quickly covered in by granulations spreading from the soft parts. In none of these three cases did an osteomyelitis follow. The latter three cases had already established osteomyelitis when they came under treatment. In Case 39 the failure of serum to clear up the process is explained by the finding of a sequestrum, the removal of which was followed by healing under another agent.

In Case 41, the use of serum was stopped, we believe, without good reason. It is possible that the leucocytogenic reaction, which is frequently marked under the use of serum, may have influenced the change of treatment. (It should be remembered that the control, in all of the cases reported, remained in the Surgical Services to which patients were assigned.)

E. SEPTIC ULCERS.

42. (13) Male, 65. Extensive septic ulcers of leg. Eight years. Streptococcus, B. Coli. Serum dressings. Clean granulations in four days. Fourteen days ready for graft.

43. (40) Female, 66. Recurring varicose ulcers, ten years (septic). Serum dressings. In five days healthy granulations.

44. (61) Male, 42. Crush of leg 10 years ago, followed by extensive septic ulcer (S.P.A. Albus, B. Coli, Diphtheroid). Thirteen days later clean, healthy granulations.

45. (62) Male, 34. Varicose ulcers, septic. Serum dressings. Twelve days no discharge. Grafted (See Graft No. 68.)

COMMENT.

Sepsis cleared rapidly, and old, indolent granulations became active, clean granulations in a very short time.

F. BURNS.

46. (30) Male, 10. First, second and third degree burns. Picric acid. Ambrine four days. Sepsis. Serum dressings. Four days clean. Eight days covered with granulations. Patient refuses graft

47. (34) Male, 33. Burns of second degree. Treated at home two days with boric ointment. Mild sepsis. Serum dressings. Four days later clean. Seven days later graft done. (See graft No. 64.)

COMMENT.

Both of these cases became septic under other treatment, and responded promptly to serum medication.

G. FRESH WOUNDS AND COMPOUND FRACTURES.

The conditions which are found in fresh wounds furnish the closest approximation we can obtain to war wounds. Their treatment should supply data as to the value of serum in prophylaxis.

48. (2) Male, 40. Compound clavicle. Op., wound packed for hemorrhage. Second day serum dressing. Ten days later filled with granulations. Fourteen days healed.

49. (7) Male, 56. Extensive laceration of leg. On account of shock, wound left open. Dirt removed. Serum dressing. Following day loose suture. Four days later death from shock and alcohol. Wound found absolutely clean.

50. (8) Male, 17. Crush of hand with lacerations. Op., wounds cleansed. Serum irrigations, suture. Serum dressing. No blood supply to distal phalanx. Two days later amputation of phalanx. Four days clean. No sign of sepsis at any time.

51. (20) Male, 40. Compound femur. Fracture of both bones of leg. Shock. Serum injection into wound. Dressing. Ten days later wound healed. Fourteen days later death from delirium tremens. No sepsis at any time.

52. (21) Male, 22. Crush and laceration of three fingers. Fingers partially torn off. Op., cleansed. Removal of nails. Serum injections. Wounds sutured. Five days later healing by first intention.

53. (50) Male, 32. Alcoholic, jumped from window, producing compound fractures of both femora and supracondylar fracture of humerus. In marked shock. Elbow wound dirty, oozing abundantly (question of rupture of capsule of elbow joint). Rapid (emergency) cleansing of skin with soap and water and alcohol. Serum injected into wounds, which were sutured. In bed with all apparatus on in twenty minutes. Eight days later wounds healed. No evidence of sepsis at any time.

54. (59) Male, 19. Compound fracture of humerus by bullet. X-ray shows bullet in several flattened fragments. Wound cleansed. Serum injected in wound following day. In seven days wound practically healed. No evidence of sepsis at any time. Discharged O.P.D. to return for removal of lead.

55. (74) Male, 45. Crush of fingers. Op., amputation of fingers. Large open surface left on back of hand. Serum dressing. Five days later granulations. In ten days skin graft.

56. (38) Male, 33. Avulsion of skin of fingers two inches by half inch. Serum dressings. Five days later granulations. Ten days later area closing in. No sepsis.

57. (54) Male, 17. Amputation, tip of finger. Serum dressings. Five days later granulations. Fourteen days practically closed. No sepsis.

COMMENT.

In all cases of fresh wounds treated with serum from the start, healing has been without evidence of sepsis.

(Several cases of sinuses, following appendectomy with drainage, and other minor forms of surgical sepsis, have been successfully treated. The results, although prompt, have not appeared significant enough in these minor processes to justify detailed description.)

TECHNIC OF SKIN GRAFTING.

If granulations are septic they should be treated for one or two days with serum dressings. With clean granulations no preparation is necessary. Exuberant granulations, if present, should be removed. Grafts are obtained by the usual methods and placed in the usual manner. Perforated compress cloth is then placed over grafted area and fastened in place by smearing collodion at margin. Sterile gauze (3 or 4 layers) soaked in serum, is then applied over this and held in place by a light bandage. Serum is then poured, or better, sprayed, through an atomizing nozzle, over the dressing, often enough to keep the grafts moist, which is about once in four hours. Dressing may be removed on the fourth or fifth day, and the surface exposed to the air for one-half hour. If, after the sixth day, there is evidence of the granulations becoming exuberant, an ambrine dressing should be substituted.

H. SKIN GRAFTS.

58. (4) Female, 6. Granulating stump. Reverdin graft. Serum dressings. Five days all grafts taking. No pus. Eleven days healed.

59. (12) Male, 38. Granulating wound following excision of carbuncle. Hairs pulled from head, roots cut off and scattered over wound. Serum dressing. In eight days small white pin-point areas seen. In twenty days, one-half of area of wound covered in with new epithelium from grafts. (A criticism of the treatment in this case is that an insufficient number of hairs was planted. The epithelial islands, which arise from the epithelium attached to each hair root, are so small that close planting should be practised in order to expedite healing.)

60. (23) Male, 5. Large granulating area following burns. Reverdin grafts. Three days, no pus. All grafts in place. Seven days all grafts growing.

61. (32) Male, 39. Granulating area following septic process, four by three inches. Point grafts. Serum. Four days, grafts in place. Eight days, grafts spreading.

62. (34) Male, 32. Granulating area following burns. Point grafts. Serum. Five days, all in place. Eight days, spreading.

63. (65) Male, 38. Large granulating area following burns. Reverdin and Thiersch grafts. Serum. Four days, all in place. Eight days, spreading. Twelve days, exuberant granulations covering in grafts.

64. (68) Male, 5. Large granulating area following septic lacerated wound of leg. Point grafts. Serum. Four days, grafts taken. Eight days, spreading.

65. (61) Male, 42. Extensive granulating ulcers covering both lower legs. Reverdin graft. Serum four days. One-half of grafts successful. Eight days, spreading. Another graft to be performed.

66. (62) Male, 34. Chronic varicose ulcers of leg (six years). Point grafts planted on old granulations. Four days, one-half of grafts successful. Fourteen days, ulcers practically healed over.

67. (41) Female, 23. Large granulating area following extensive laceration of leg with septic compound fracture of both bones. Grafted (pin-point) while area was still bathed in pus from fracture. Four days later all grafts in place. On tenth day dressing was permitted to dry. Grafts all black. Dressings kept moist and on twelfth day grafts all in place, healthy and spreading.

68. (40) Female, 66. Old varicose ulcer (10 years). Reverdin grafts, serum. Four days, only few grafts have taken. Eight days, spreading.

COMMENT.

In ordinary methods of grafting, the surface is covered with a puriform discharge for several days. In grafts under serum this discharge does not ordinarily appear, the granulations remaining clean and rosy. Apart from the chronic ulcers, where the percentage of grafts which take is always problematical, striking has been the high percentage of takes. The success of the hair graft in Case 59 demonstrates so conclusively the value of serum in controlling the sepsis and supplying nutrition to the growing epithelium, that no comment is necessary.

In Case 63, although all of the grafts took, they were allowed to become buried in exuberant granulations. Serum is a more active stimulant of granulation than any agent we possess. Its use should probably have been stopped on the seventh or eighth day in this case, and a less stimulating dressing, such as an ointment or an ambrine dressing, used.

In Case 68, grafts were placed on an old varicose ulcer after several days' preparation by serum. Failure to succeed in this case is thought by the house officer to have been due to excessive thickness of the grafts. Another possible explanation lies in the dense scar tissue of the base of the ulcer, which was not removed, and through which all of the vessels to the granulating surface had to pass.

I. FINGER-END GRAFT.

69. (73) Male, 35. Traumatic amputation (complete), through middle of terminal phalanx including bone and whole of nail. After removal of nail, finger sutured in place one-half hour after amputation. Serum dressing. Five days later slight sloughing of wound edge. Slough removed. At end of ten days site of slough granulating. Firm union of soft parts. Restitution almost perfect. (The interesting point in this case was not so much the restitution of the finger, but the fact that even though there was not enough circulation to prevent a partial necrosis, the process of sloughing was, and remained, sharply limited without suggestion of sepsis.)

CONCLUSION.

The results in these cases speak for themselves. Certain conclusions are justified:

1. Serum will control a septic process, wherever contact is made between the serum dressing and the infected tissue.
2. It is absolutely harmless to normal tissue.
3. As a prophylactic agent in fresh wounds it is of value.
4. Serum is a most marked stimulant of granulations. We believe that grafting can and should be practiced earlier following the use of serum than under any other agent.
5. Injections of unheated beef serum are followed by rises in temperature, usually slight, perhaps with chill, but the reactions are short and not severe. Used as a dressing to wounds, no matter how large the surfaces are, it gives rise to no anaphylactic response.

REFERENCE.

[1] Bull. de l'Acad. de Méd., 1915, xxiv, 522

PHYSICAL EXAMINATION OF FACTORY EMPLOYEES: TWO THOUSAND CONSECUTIVE CASES AND THE DEFECTS FOUND.

By Raymond W. Cutler, M.D., Worcester, Mass.

The following defects, discovered during the routine examination of applicants for positions at the Norton Company, may be of interest as a general index to the physical condition of the average workman in this country. A large proportion were of American birth, but among the two thousand examinations from which the defects are shown nearly every nationality was represented. The positions applied for represented all grades of occupations, from common day laborers to skilled machinist and office workers. The physical examination in nearly every case was made before the man was formally engaged. Although many defects were noted and recorded, only 84 men, or about 2 1/3%, were found with defects severe enough to warrant non-approval. This percentage was further reduced when those cases temporarily non-approved returned after having their defects corrected. In order to show the methods used at this factory when examining an applicant, a brief description of a routine examination will be given.

ORDER OF EXAMINATION.

The man, who has been previously interviewed by a member of the employment department in regard to his ability to fill the position, is turned over to a male nurse in attendance at the examination rooms and conducted to one of a series of dressing-booths which separate the examination rooms from the employment department. He is requested to remove his clothing down to his waist, remove his shoes and stockings, and, while waiting his turn, cover his shoulders with a blanket which hangs in the booth.

While the man is undressing, the nurse fills out a physical examination card bearing the man's name, age, address and department in which he is to work. When the man is ready for the examination he steps into the examination room, and is introduced to the physician. The following examination is carried out:

1. The height and weight are taken.
2. The employee is then placed ten feet from a set of Snellen test charts, and each eye tested separately for distant vision. If he is unable to read English, object charts are used. The eyes are inspected for the presence of corneal scars or opacities, conjunctivitis or any other abnormal condition.
3. The ears are tested with an Ingersoll watch for acuteness of hearing and inspected for impacted cerumen or a discharge from chronic otitis media.
4. Then follows the inspection of the nose for deviation of the septum or occlusion by hypertrophied turbinates.
5. The teeth are inspected.
6. The throat and fauces.
7. The neck. The submaxillary-posterior cervical and thyroid regions are palpated for scars of previous abscesses or thyroid swelling.
8. The lungs are quickly percussed and auscultated, as much time being taken as is necessary to make sure they are sound. The same is done with the heart.
9. The man is requested to drop his trousers to the floor and the external abdominal rings are explored with the tip of the index finger. Pressure is exerted against the scrotum, pushing a fold of the skin upward with the finger into the ring. The size of the ring is determined and the man is asked to cough while the finger is still in the ring. A mass protruding through or pushing against the opening of the ring is easily felt except in cases of marked obesity. In some cases the examination can be made easier and more accurately by asking the man to bend forward at the hips at the same time relaxing the abdominal muscles and repeating the cough. The presence of a hernia is then easily determined. The groin is palpated, while he coughs, for slight bubonocele or direct hernia. The pressure of a slight bulging of the posterior walls of the abdomen is recorded. Inguinal adenopathy is determined by palpation.
10. The scrotum is palpated for varicocele and any other abnormal condition of the scrotum. As the examination is made with the intention of causing the least amount of embarrassment, questions in regard to venereal diseases are not asked the man.
11. The extremities are inspected, upper and lower, for amputations, varicose veins and flat feet.
12. The back is inspected and the man told to pull up his trousers, which he has dropped while the inguinal region and extremities were examined. As he bends over, the spine is inspected for curvature or prominent vertebrae.
13. The skin is inspected.
14. He is next placed on a table and the abdomen palpated. The heart is again auscultated for the presence of murmurs, whch may have been overlooked while he was in the upright position.
15. He is seated near a desk, to which a Mercer syhygmometer is attached, and the systolic and diastolic pressure is taken by the auscultatory method. The patellar reflexes are tested.

This concludes the examination unless there are indications for urinalysis. A urinalysis is done on all men over 40 years of age and those with blood pressure above 140 mm. Hg. The examination takes from six to twenty minutes, according to the condition of the man.

The man then steps back in his booth and puts on his clothing, returning to the employment department through the same door by which he entered the booth. This does away with any confusion and does not interrupt the examination of the next man.

The physical defects are summarized on the back of the examination card, and the man is given a rating which is based on the opinion of the physician as to what kind of an industrial risk the man will make. This rating is placed at the bottom of a card made out by the employment department. The rating is indicated by the letters A, B, C and D.

RATING.

A—Signifies a perfectly normal man.

B—The man has one or two slight defects.

C—This rating is given to men over the age of 45 and to those with defects not severe enough for non-approval but which make them poor industrial risks.

D—represents those men considered bad industrial risks, and includes all ruptures, those with pulmonary tuberculosis and defective vision uncorrected by glasses. A rating of D is not always final, as it is often changed after men have returned with their defects corrected.

The employment department is notified in regard to bad defects, and they decide whether or not the man shall be rejected.

The following defects were found in 2000 consecutive examinations:

Defective vision: one eye	75
both eyes	89
Corneal opacities	10
Blindness in one eye	7
Strabismus	3
Sub conjunctival hemorrhage	2
Cataract	1
Pterygium	1
Total	188
Not approved	27

Men whose vision in one or both eyes was reduced two-thirds of normal were approved only after they had provided themselves with properly fitted glasses. The men were told of the importance of having their vision corrected at once, and were given the names of eye specialists, one of whom they were advised to consult at their earliest convenience.

Defective vision in one eye so severe that the man was practically blind in that eye was reason enough for non-approval except when a position could be found where there was no possibility of injuring the good eye, thus causing total disability. Although a large number of the men, not approved on account of defective vision, came back later with glasses, several men did not return.

Throat and Mouth.—Very few men had perfectly good teeth, and a large number had symptoms of pyorrhea alveolaris. Hypertrophied tonsils were present in seventy-nine cases.

Nose.—As a perfectly normal septum is rarely seen, only those cases of marked deviation were recorded. Many of these were associated with external signs of a previous fracture of the nose. The high arch with narrow palate, which is mentioned in the textbooks as an etiological factor of deviated septum, was rarely encountered.

Obstruction of the nose, causing mouth-breathing, no doubt has some bearing on the health of those working in dusty departments, and when present in a man with any respiratory trouble should call for caution in placing the man. Men with deviated septa frequently come to the company hospital from dusty departments, complaining of a dry throat with slight cough and hoarseness. Rarely was it necessary to transfer them to other departments after they had received local treatment with instructions as to the simple hygiene of the nose and throat. Those cases with severe deformity of the septum were told how the defect could be corrected by operation. One hundred and thirty-four deviated septa were recorded.

Lungs—The same care was taken in placing men with impaired lungs. Men found with active signs of pulmonary tuberculosis were not approved. A few cases with inactive signs in one lung were not approved for work inside the factory. Men with active tuberculosis before being rejected were told their lungs were not normal and were advised to consult their family physician at once for advice and treatment.

Defects of Lungs.

Pulmonary T. B.	10
Acute bronchitis	5
Chronic bronchitis	6
Emphysema	2
Scar of old empyema	2
Dry pleurisy	1
Asthma	1
Total	27
Not approved	4

Heart. Sixty-eight men were found with heart murmurs which were summarized as functional or organic endocarditis. Unless there were physical signs of broken compensation, they were allowed to work, but were later required to report at the hospital to be checked up. Experience has shown that factory employees with heart lesions are able to continue at work without detriment to their health if they are properly supervised and examined from month to month. Three men with cardiac lesions, accompanied by hypertension and nephritis, were not approved.

Extremities.—The most frequently-found defect was flat-foot, varying from a simple sagging of the arch to more severe deformity, characterized by absence of the arch with pronation. A large number had a mild form of flat-foot associated with hallux valgus. Questions asked men with flat-feet usually failed to give a history of previous trouble, although many of the men later came to the hospital for treatment. Two men with artificial legs were accepted. Amputated fingers and deformities of the elbow joints from old fractures were not considered bad industrial risks, as the men had become accustomed to the deformity and had gained a dexterity which gave them perfect control of the hand or arm.

Defects of Extremities.

Flat-feet	347
Varicose veins	8
Ankylosis of elbow	3
Amputations: leg	2
toes	3
fingers	6
Chronic phlebitis	1
Chronic infantile paralysis	1
Total	371

Abdomen.—Very few defects were recorded in this region. Frequently a laxity of the posterior walls of the abdomen, with slight bulging on coughing, was noted. Although simulating an inguinal hernia, it was usually associated with a normal external ring. Eighteen men had appendectomy scars. Two ventral and one umbilical herniae were recorded.

Inguinal Region.—Rupture is by far the most frequent cause for non-approval. The following classification of hernia, accepted by the Conference Board of Physicians in Industrial Practice, was used for tabulating the condition of the external ring.

First Degree,—The external ring admits the tip of the finger.

Second Degree.—The external ring admits the thumb and there is some impulse against the thumb.

Third Degree.—A definite mass is present in the inguinal canal when the patient coughs, or on standing.

Fourth and Fifth Degrees.—When the mass passes the external ring and protrudes into the scrotum or bulges through abdominal muscles.

The following degrees of hernia were recorded:

2° hernia (not true hernia)			277
3° "	right side	7	
	left "	0	7
4° "	right "	9	
	left "	5	14
5° "	right "	11	
	left "	5	16
Both sides, 3°		4	
" " 4°		8	12
Total			326
Not approved			49

All cases with third degree hernia, or more, were not approved. Those having large external rings were cautioned against unnecessary straining while lifting. A large majority of the men discovered with hernia were unable to give a definite history of the time of rupture and several were unaware of the defect. Three men were wearing trusses as a prophylactic against rupture. All had perfectly normal rings and there was no bulging in the groin.

Genito-Urinary Region.—Defects of this region were mostly varicocele. No defects were found severe enough to warrant non-approval, although one man admitted before being examined that he was suffering from acute gonorrhea. He withdrew his application for work when informed that he would not be approved. This is a rather unusual record, as it was the only case of venereal disease encountered in the 2000 cases.

Varicocele was classified as follows:

First Degree.—Thickening of the cord.

Second Degree.—Thickening of the cord and dangling testicle and scrotum.

Third Degree.—Thickening of the cord and dangling testicle and scrotum with laxity.

A severe form of varicocele, with impulse on cough, was frequently encountered, requiring differentiation from a hernia.

DEFECTS.

Varicocele	154
Atrophy of testicle	9
Hypertrophy of testicle	6
Absence of testicle	2
Hydrocele	2
Undescended testicle	6
Total	179

Spine.—Because of the frequency of strained backs which come to the hospital for treatment, special care was taken to keep men with defects of the spine out of those departments requiring heavy lifting. Slight lateral curvature of the spine was noted in quite a few cases. The lateral curvature with a rigid spine was differentiated from the flexible postural defect by having the man draw his body up by his hands on one of the doors of the examination room. The upright rod attached to the weighing scales was utilized for comparing the height of each shoulder. Several lateral curvatures of the spine, due to posture, were told of their condition and advised to take exercises for overcoming the deformity. Three cases of chronic Pott's disease were approved for positions not liable to aggravate their condition.

DEFECTS.

Lateral curvature	15
Anterior curvature	3
Chronic Pott's disease	4
Total	24
Not approved	1

Skin.—The following skin lesions were recorded:

Acne	50
Psoriasis	3
Eczema	3
Fatty tumors	5
Cysts	4
Urticaria	1
Pernicious anemia	1
Thyroid enlargement	1
Total	68

Blood Pressure.—The following results are shown from 1000 observations of the systolic and diastolic pressures. The blood pressure readings are divided into ten-year periods.

	AGE 15 TO 30 YEARS	AGE 30 TO 40 YEARS	AGE 40+ YEARS
Systolic pressure	127	133	144
Diastolic pressure	80	81	91
Pulse pressure	47	52	55
Pulse	84	81	81

The averages are somewhat higher than those given in life insurance statistics, but the following factors may be a cause of the higher averages.

1. The readings were on men doing fairly hard manual labor.
2. They were taken after a hearty meal between the hours of one and four o'clock in the afternoon.
3. The anticipation of the examination probably had a psychic influence on the pressure. This was noticeable by a quickened pulse rate and frequent questions from the men who were ignorant of the use of the sphygmometer. Many entertained an idea that some form of electricity was being applied when the cuff was attached.
4. Occasionally men had used alcohol a short time before coming to the factory for work.

Young men 18 or 20 years of age frequently gave a systolic pressure of 130 mm. Hg. and above. The initial reading is not always a true reading, as experience has shown that a second reading five or ten minutes after the first reading invariably gave a lower result. Men when examined at some later date also showed a lower reading as a general rule. The auscultatory method was found to be more accurate than the palpatory method, but gave a slightly higher reading. The extra time consumed in taking both the systolic and diastolic pressure is practically nil, and fewer failures to get a reading were encountered by the former method. Sixty-five men with functional and organic heart murmurs averaged the following blood pressures.

	Up to 20 Years	Age 30 to 40 Years	Age 40+ Years
Systolic	138	152	148
Diastolic	95	85	82
Pulse pressure	43	67	66
Pulse	78	77	88

CONCLUSIONS.

1. The average man going about his daily work has minor defects which at the present time cause him no discomfort, and he is unaware of their presence. Many have never had a complete physical examination—in fact, many have never required the services of a physician. These minor defects, if not attended to, may later on become a menace to their health, and be a direct cause of disability.

2. The industrial physician is in a position to give advice to the factory employee before he goes to work, and often can prevent men being placed in departments which might be detrimental to their physical welfare.

3. The men appear interested in knowing the result of the physical examination, and seldom resent being rejected for some position which is liable to cause disability, if they have previously been told why they are not fit for the position.

Harvard Medical School.

THE FUTURE OF MEDICINE.*

By President Charles W. Eliot, Harvard University.

[Abstract of address delivered at the triennial dinner of the Harvard Medical Alumni Association at the Harvard Club, May 12, 1917.]

I have had the privilege of knowing a good deal about the past sixty years of the medical profession. I appreciate fully the excellent picture which Dr. Thayer has just put before you of the medical education and the practice of medicine twenty to twenty-five years ago; and I have clearly in mind many earlier pictures of sixty, fifty, forty, and thirty years ago. I have personally witnessed large progress in the Medical School of Harvard University, in which two generations of teachers have taken part. At another medical meeting not long ago, I told of some of the things I saw in the Medical School of 1869; and I noticed that the picture I then painted caused some amusement among my medical audience. Indeed, some expressions of incredulity were visible,—particularly in regard to the students' attending six hours of didactic lectures on end five days in the week, and in regard to the extreme shortness of the required medical term, which then did not exceed four months out of the year. I noticed expressions of incredulity and amusement when I said that each candidate for graduation passed nine oral examinations of five minutes each, and won his degree if he passed in five subjects out of the nine.

If I reflect on the great progress in medical education, and the extensive changes in the medical profession itself since I first began to take notice of these matters, I can look forward with confidence to great progress in the future. I cannot find words to express the confidence I feel in the future progress of medicine as a science, as an art, and as the controller of many of the worst evils that afflict human society. The progress of the last sixty years, and our clear vision of the conquests still to be made should assure us all of the magnificent future of medicine.

One of the previous speakers alluded to my interest in preventive medicine. I have taken a strong interest in that branch of medicine, because that phrase covers an immense new service of the medical profession to the community, and much future happiness for the profession itself. To prevent evils and wrongs on a large scale by one's own personal wisdom and diligence gives even greater satisfaction than to cure individual cases of suffering from evils or wrongs, and the good done to the community by prevention is broader and ampler than the good done by curing. Within the last twenty years many new employments and serviceable positions have been opened to graduates in medicine who have made special studies in preventive medicine. Such are the chief positions in the Medical Corps of the army and navy, in and under boards of health, and in the sanitary service of cities, towns, and schools. The movement tends to the acceptance by medical men of salaries from public and semi-public boards, and from corporations in great number; salaries which yield a sufficient though modest support for a family, and permit the recipients to devote themselves, without interruption or distraction, to professional work, largely of a preventive character. The profession has long been familiar with service to insurance companies. It is going to become familiar with service to government—national, state, and municipal—and to corporations, educational, charitable, and commercial. I lately visited two large manufacturing corporations that were paying good salaries to medical men and nurses who devote their whole time to the corporations' workmen and their families, their services being both preventive and curative, but chiefly preventive. The indications are that in the future a larger and larger proportion of men well educated in medicine will devote themselves chiefly to preventive medicine. This change is by no means to be regretted. On the contrary, the profession and the community are to be heartily congratulated on it.

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Important changes have already taken place in the private practice of both physicians and surgeons. The automobile and the telephone have enlarged the territory over which a skilful man of good quality can comfortably practise; and these new facilities promote the most cheerful, discerning, and skilful men, at the expense of the less cheerful, discerning, and skilful. This change, of course, supports sound and well-directed medical education.

The private practitioner, whether physician or surgeon, is getting more and more dependent upon laboratories, and on experts in the use of complex apparatus, and in the making of complicated tests or explorations for diagnostic purposes. The increase in the number of these, and indeed in the public appreciation of specialists, gradually led to a new method of determining fees in a part of the medical profession. Fees increased very much, not only for surgical specialists but for the obstetrician as well. Then the method of charging "what the traffic will bear" came into use. We all know that there are now some large medical establishments which proceed on that rule, taking much pains to determine what the probable or ascertainable income of the patient is. It is not clear to the learned and scientific professions at large that the honor and dignity of the medical profession have been advanced by the use of this method.

In the present crisis in the life of the American people, the medical profession cannot but rejoice that it was better prepared for war service than any other profession in the country, including the military and naval profession. It was prepared to apply every medical and surgical invention of the last fifty years at once for the benefit of the army and navy. It did apply inoculation for typhoid, and conducted a successful resistance to typhus. It was already preventing yellow fever, and curing and preventing hookworm disease and malaria. It promptly demonstrated that surgery was something more than cutting off and cutting out—it could rectify and repair. It could make immediate application in war of the recently discovered improvements in orthopedic and dental surgery. The first aid which America was able to give to the European combatants was medical aid. This country is not ready yet to give effective military or naval aid; but we were ready to send in the first year of the war doctors, surgeons, nurses, and orderlies by the thousand, thoroughly prepared to render efficient service at the great hospitals at the front or in the rear. In war as in peace, the medical profession has shown itself to be thoroughly altruistic, beneficent, and self-sacrificing.

The medical profession in America justly claims to have developed and greatly improved the vocation of nursing, and to have invented and established the district nurse, and the social worker in connection with hospitals and dispensaries. The district nurses and the social workers going out from hospitals form a new class of teachers whose contribution to the welfare of the community grows more and more important. The family physician also is becoming more and more a teacher of hygiene, a preserver of health and an adviser in family anxiety and distresses.

The future of medicine is bright beyond compare. It is in full harmony with the democratic spirit which is pervading the world, with the new sense of human brotherhood, and with the new conviction that religion is not forms and ceremonies, or rites and dogmas, but a tolerant, friendly, and coöperative spirit, which prompts to common good works.

ADDRESS.

By G. F. Freeman, Surgeon, U.S.N.

I fully appreciate the honor of being present tonight to represent the Medical Corps of the Services, and have the added pleasure of being among classmates and former teachers. I have asked permission to vary the subject originally assigned me, and to speak of the general medico-military tasks of the army, navy, and medical profession at large.

Just as the medical profession of this country is composed of the most varied types of physicians, engaged in diverse lines of research, or work in the practice of their profession, so also the medical department of a great army and navy requires the services of men of the most varied talents and achievements. A rational scheme of national defense must include all these types and, furthermore, discern their special talents, so that all may with the least loss of efficiency fit into some cog of the national need. There is no one but what can help in some way.

There are three great tasks confronting the medical profession, each task having many subdivisions:

First, we must aid the Allies by base hospitals and medical supplies. This work is already started, and Harvard is the first to respond to this call.

Second, we must meet the great obligations to our own army and navy by supplying the necessary number of medical officers, and there must also be others in training to fill vacancies.

Third, all this must be accomplished with the least possible disarrangement of our vast medical obligations to the community, and to the industries we must conserve.

We have, as a country, passed one stage of the preparedness journey that of providing for the establishment of a suitable army and navy.

We have also started to meet the first of our particular medical obligations, that of sending medical aid to Europe.

What we as a nation should have done in the past it is now futile to discuss, for we are already in the midst of the second part of our work,—that of providing and training the military establishment, this latter including those of the medical profession who will be called to duty in different capacities.

The very first work in the formation of any military force is the physical examination of recruits, and this work requires the services of a great force of doctors, who must be somewhat trained in the special peculiarities of recruiting for military service. The medical profession of the United States will thus be severely taxed from the first, as has been that of England and France.

These tasks can be better understood by the following estimates of increments than increases. First, in regard to the navy, as the problem is less than in the army, although the country must have ships of all classes before any concerted aid can be given.

In the summer of 1916, Congress authorized a navy of 77,956 enlisted men, and by special authority vested in the President, this force was increased to 87,000, not including the present strength of the army, navy, and National Guard, and was recently increased by Congress to 150,000. The United States Marine Corps, which is the mobile army within the navy, has been increased, first to 17,000, and recently to 30,000. The above numbers do not include officers nor certain classes of enlisted men. The navy allows six and one-half medical officers per 1000, and an estimate of the increase in the Medical Corps of the navy is something over 700. In June, 1916, the total strength of the Medical Corps of the navy was 332; thus the corps will be three times as large in the future as in the past. For a division of marines taking the field, there will be required about 156 naval medical officers, or about one-half of the former number in the entire navy. They are also allowed medical reserve officers who will soon be fully experienced in navy life, and all will be needed, some as specialists, and some for regular duty.

These problems of the navy are great, but for the army the task is proportionately greater.

First, there will be the increments to be filled by volunteer enlistments. To fill the authorized war strength of the army: 161,519 men and officers. To fill the war strength of the National Guard: 206,349. First training "cadre" or those necessary by War Staff College recommendation—to train the 547,000 of the first selective draft, thus leaving that number of *vacancies* for the voluntary increments in the army and the National Guard: 160,000. Recruit training units for the National Guard, to replace casualties, and those sick, estimated at one-third of the full strength of the force: 110,000. Recruit training units for the regular army: 98,000. Total estimated: 736,000. The above estimates are for what might be called the volunteer force, as opposed to the selective draft, which would add 547,000, or a grand total of 1,283,000 increase. By comparison of volunteer and selective draft, the volunteer increment is greater than the selective draft.

The army allows 7 medical officers per 1000, and the new forces alone would require between 9000 and 10,000 in the Medical Corps. Of this number about 2000 will be required for the Regular Army, which in 1916 had 440 in the Medical Corps, and thus in the future, will be more than five times as large as in the past.

Many of those who will be called are already in the service as reserve officers; they will, however, be taken from those who are available for work in civil life. The above numbers seem large, but are estimated from figures given by the secretary of war and the secretary of the navy.

The country, out of its 120,000 physicians, will have to meet this demand, and the medical profession is already doing its share. I have so often heard the expression, "If the country needs me, I want to go," that I have taken it as the sentiment of the medical profession at large. It means that there will be very little selective drafting for the medical profession; it will be a volunteer offering.

The third great task of the medical profession is to conserve the interests at home. This work will naturally fall on those who are over the military age, or on those who are not physically qualified for military services, but are, nevertheless, qualified for hospital duty and active practice. They will have to do their bit by *serving* their country *at home*, while their brothers of the army and navy are doing the *active service*.

The army and the navy are doing their best to train the Medical Corps for the special duties of war, and the medical profession on its part is responding to the call for more medical officers. Harvard is among the first in all the branches of work, and in furnishing officers for the Medical Corps of the army and the navy (8 ambulances).

To meet the need of the thousands of Medical Corps men needed, the medical profession of the United States faces a great responsibility. It means sacrifice, but the spirit of self-sacrifice is inherent in the doctor.

In speaking of the sacrifices of eminent men in the *Medical World*, Lord Northcliffe said: "If there be degrees of chivalry, the highest award should be accorded the medical profession, which at once forsook its lucrative practices in London, Melbourne, and Montreal, in a great rally of self sacrifice. The *history* of the great sacrifices among them brings home to those who have only the big hospital idea of the war doctor, sad facts which should lead to due understanding of this veritable body of Knights Templars in this great Crusade." There is already the spirit in this country that will entitle the medical profession to the same praise as given by Lord Northcliffe. We have traditions of past wars and examples to which we can point with pride, and I have faith that we will follow these examples.

It is not the army surgeon or the navy surgeon alone that merits all the praise, or the fact that the doctor is serving with a military unit, that entitles him to an award. He is only a part of a greater fraternity—the medical profession—which has its deeds of chivalry in peace as well as in war. Whether the doctor is in the service of his country with the army or the navy, or is working for the same country at home, the spirit is the same.

The work has been started, and there comes the added responsibility of the continuance of the work next year, and possibly some of the years that follow; thus preparedness is not only for this year but also for future years.

"Heaven gives the crown of victory to those *only* who, by habitual preparation, win without fighting, and at the same time forthwith deprives of that crown, those who, content with one success, give themselves up to the ease of of peace."

Book Reviews.

First-Aid to the Injured and Sick, an Advanced Ambulance Handbook. By F. J. Warwick, B.A., M.B., M.R.C.S., etc., and A. C. Tunstall, M.D., C.M., F.R.C.S., etc. Tenth edition, revised, 250 pp. New York. William Wood & Company. 1917.

This small volume, now in its one hundred and forty thousandth printing, is as excellent a handbook of first aid as the market affords. It is particularly pertinent in that it contains directions for the care of the wounded on the battlefield such as has proved best by experience in the present war. The first fifty pages are given to a brief exposition of the structure of the human body,—its bones and organs and their functions,—the blood and its circulation, respiration, digestion, etc. Part II treats at considerable length of bandages, and gives over one hundred illustrations of methods of applying. The section of hemorrhage and wounds contains over thirty illustrations; that of dislocations and fractures about forty illustrations and artificial respiration and transportation of the sick and injured about one hundred illustrations. The last section on transportation is especially admirable, and covers this subject from the rescue of persons from burning buildings and mines to exhaustive directions for carrying soldiers from the battlefield. The book is highly to be recommended.

A Text-book of First-Aid and Emergency Treatment. By A. C. Burnham, M.D., Medical Corps U. S. R. Philadelphia and New York. Lea & Febiger. 1917.

The experience of many years in the emergency wards of some of the largest New York hospitals is the basis of this book. It is intended as a text-book for the untrained first-aid worker as well as the advanced student who may be expected to practice his art under the conditions of modern warfare. The character of the text deviates considerably from that of many of the older books, the student being drilled in the principles of diagnosis and treatment instead of being limited to didactic rules of procedure in individual cases. Because of its attention to common accidents and illnesses and to the explanation given of their symptoms and the structures and functions of the part of the body in which they occur, the book is especially well adapted to the home nurse.

Food for the Worker. By Frances Stern and Gertrude T. Spitz. With a foreword by Prof. L. B. Mendel. Boston. Whitcomb & Barrows. 1917.

This volume is the outgrowth of an experience as visiting housekeeper both with the Association for the Relief and Control of Tuberculosis and with the Boston Provident Association on the part of Miss Stern, assisted by Miss Spitz, who was Dr. Locke's assistant in the preparation of his book on "Food Values." It presents, in condensed form, a statement of food requirements of a working family, the cost of such food and the manner in which food can best be purchased and cooked.

The authors have prepared menus for seven weeks with tested recipes giving food values and costs for the dishes included in the menus. The daily cost of food is on the basis of twenty cents per day per person, at prices of 1914. In the supply sheet, prices up to July, 1916, have been given. All weights of the component food principles are figured, and also the values in calories of each serving. The cost in cents is given for each serving.

Whatever may be the changes in prices, this attempt to solve the problem of an adequate, *varied* diet on an inadequate wage is one that must be of great service not only to all social workers, but to any intelligent housekeeper of moderate income who wishes a foundation on which to build a family's diet.

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ERNEST GREGORY, *Manager,*
126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE DETERMINATION OF RENAL FUNCTION.

THE lowering of the operative mortality in kidney conditions from the high mark of over 50% not many years ago, to the present low mark of about 10% is, perhaps, due more to the development and the use of the newer tests for kidney function than even to better surgical technic. Without a definite knowledge of the ability of the kidneys to withstand the effects of an operation without a disturbance of the balance of circulation, resulting in acute congestion, suppression of urine and uremia, operations must be expected to end disastrously. In such cases operations will shorten life rather than prolong it. Where only one kidney is potent, of course the removal or serious operative injury to the other must end fatally as a direct result of the operation. The determination, on the other hand, that the kidneys are below par, the introduction of the proper regimen, and the postponement of operative interference until improvement is shown by the functionation tests, will save many patients.

Of the various methods devised to test the functional capacity of the kidney, the test for urea is the oldest and still much used. It can be used for the determination of the capacity of both kidneys or of each separately. The total excretion of urea for both kidneys, or the comparative excretion for each separately on catheterization of the ureters, are the indices of function. At present the phenolsulphonephthalein—phthalein—test and the phloridzin test are used to determine the functional capacity of both kidneys, while the indigo-carmin test is used to determine the capacity of each kidney separately. For the first test the profession is indebted to Geraghty and Rowntree. For the development of the phloridzin test credit is due to Greene. Völcker and Joseph were the first to use the indigo-carmin test. The phthalein test depends upon the elimination by the kidney of urine that assumes a bright red color upon the addition of an alkali. The percentage of drug elimination is determined by comparing the intensity of the color with a standard solution of known strength by means of the calorimeter. In making the test about 1 cc. of the standard test solution is injected into the muscles of the back. The estimation of renal capacity is made by collecting all the urine after an hour, then after two hours, and so on, being repeated even for weeks in doubtful cases. The amount of secretion is estimated by the calorimeter. When the appearance of the drug is delayed more than 25 minutes and the output is less than 20% for the first hour, then operation must be postponed. But it is not so much the percentage or quantitative production that is the important factor in this test, as the ability of the kidneys to maintain a production without diminution, no matter how small, over a long period. It is when the capacity of the kidney to excrete this drug is diminishing, or when to begin with there is only a trace, that operation must not be undertaken. When the quantity is maintained, even if very low, operation may be undertaken in selected cases. This test is the best test for stability in function. Cases of prostatic obstruction with large amounts of residual urine are less likely to maintain the quantity than the chronic catheter cases. The phthalein test is the test of election in determining function in prostate operations.

The phloridzin test depends upon the fact that this drug causes a peculiar activity of the kidney tissues, enabling them to withdraw sugar from the blood and to excrete it. When function is good, large amounts of sugar will be excreted on the injection of the usual 30 minims of a 1-400 solution. Normal kidneys should excrete at least 1% of sugar. In this test the delay in the time of excretion is, perhaps, as important as the quantity. A delay of over 30 minutes is a danger sign, and indicates some profound pathological disturbance of the kidney.

The time factor, however, is the most important factor in the indigo-carmin test to determine capacity of the kidneys separately, in contradistinction to the quantity factor in the other tests. After the injection of this drug into the muscles, a blue stream of urine should be observed with the cystoscope to flow from the orifice of the ureter, in from five to eight minutes. Delay in the appearance of the blue stream spells incapacity of the kidney on the side on which there is this delay. The degree of time of delay determines the degree of incapacity. The cystoscopic observation with a watch are the determining factors with this test.

AN APPEAL TO THE PROFESSION.

The Association of American Medical Editors issues a call to the physician to enter his country's service at this time of need, and we are glad to print in these columns this appeal, in the hope that it may impel those of our readers who are in circumstances which permit, to enter the Medical Reserve Corps.

In this world's war, your service is absolutely essential. The medical officer bears the same relative position in war as in peace, in that he is a conservator of health and life. Through his skill, thousands of men receiving slight casualties are returned to the fighting force, thus conserving the physical strength of the army. In base, field and evacuation hospitals, doctors are as essential as in civil institutions, where the sick and injured are cared for. As regimental surgeons and on transports and in the Sanitary Corps, must the Government have doctors if we are to terminate this war successfully.

Your contribution to your country at this critical time is your service, which you can give for the period of the war as an officer in the Medical Reserve Corps. That your country needs you, is best answered in that she is calling you now.

The fighting forces are constantly expanding, and such expansion calls for additional doctors, and even with the troops now in training and under mobilization (about two million) the Surgeon-General has not enough doctors to fill the requirements.

Young physicians, never again in the history of medicine in this country will such an opportunity be afforded you to serve your country as well as the best interest of yourself.

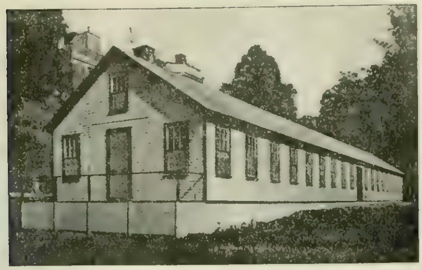
The experience which you will gain by being commissioned in the Medical Reserve Corps and seeing active service, will be worth more to you in a professional way than you could acquire in years of practice in civil life. The pay granted to officers in the Medical Reserve Corps is sufficient not only to cover all needs, but to enable you to lay aside a comfortable balance, and while the older men in the profession have come forward, it is to the younger men that the greatest benefits accrue.

The experience will prove broadening, both professionally and mentally. With this experience and the thought that you have served your country in time of need, you will return to civil life and receive the further benefits from your patients, friends and acquaintances, always accorded to one who has been so prominently individualized as this opportunity will afford you.

Secure an application blank at once; fill it out and present it to your nearest examining board. Do not live to regret that you did not have a part in your country's great struggle for democracy, which means liberty.

A PORTABLE HOSPITAL UNIT.

On Monday afternoon, October 15, the portable hospital unit erected by the New England Deaconess Association near the Deaconess Hospital, Longwood, was informally opened to the public for inspection. This building, which is known as the Willard T. Perrin Ward, is the first portable hospital unit to be built within the city limits of Boston for the benefit of sick and injured soldiers and sailors. It is a practical duplicate of the portable field hospital now in use in France



"This hospital is a complete unit, equipped with thirty-five beds, including three private rooms that may be used for special cases, and with service rooms usually found in any up-to-date hospital ward. The building is practically the same as those now in use as field hospitals in France, and was suggested by Dr. Daniel Fiske Jones, who was a member of the Harvard Hospital Unit in France last year. It is 108 feet long, 20 feet wide, one story high, and has an abundance of light and air. It will be heated and lighted from the present hospital central plant, so that it may be used during the winter months, the pipes and wires being carried underground to the building. Modern plumbing is installed, and in every way the comfort of the patients has been considered.

The cost of this unit, complete, furnished ready for service, will be between $5000 and $6000. The Government has been notified that patients will now be received at any time, either in this building or at the main hospital. This ward unit is named the 'Willard T. Perrin Ward of the New England Deaconess Association for Sick and Injured Soldiers and Sailors.' The committee which has had the construction in charge consists of William T. Rich, chairman, Dr. Daniel Fiske Jones, Clarence W. Williams, Willard T. Perrin, Miss A. A. Betts, Mrs. F. H. Eaves, Miss Ellen T. Emerson, Mrs. H. C. Gallagher."

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MEDICAL NOTES.

Incorporation of "Pediatrics" in "Medical Review of Reviews."—At about the time that the *Medical Review of Reviews* was founded, Professor Dillon Brown, of New York, established a semi-monthly journal devoted to the diseases of children, called *Pediatrics*. The opening article was by A. Jacobi, and the leading physicians of the city, among them J. Lewis Smith, Reginald H. Sayre and William H. Park, contributed to its pages. Latterly it has been edited by William Edward Fitch, but Dr. Fitch has recently been appointed a Major in the United States Army, and Dr. William J. Robinson, editor of *Medical Review of Reviews* has acquired his blue pencil and subscription list.

Pediatrics will no longer appear as a separate publication, but has been incorporated with the *Medical Review of Reviews*. Beginning with January, however, the *Medical Review of Reviews* will contain a special department devoted to Pediatrics. This feature is but one of the improvements scheduled for the coming year. Important symposia are now in progress, and the editor will contribute a second series of Pathfinders in Medicine.

American Public Health Association. The forty-fifth annual convention of the American Public Health Association opened in Washington on October 18. Herbert C. Hoover, director of the United States Food Administration, addressed the convention at its first general session.

The program for the afternoon called for a joint session of the Association with the American Social Hygiene Association, the Baltimore Medical Society and the Maryland Society for Social Hygiene, at which the chief topic for discussion was the social hygiene in training camps and the activities to reduce the prevalence of easily preventable disease in the army.

A symposium on easily preventable disease control in the army, the navy and the civilian community was given by Col. F. F. Russell, U.S.A.; Surg. R. C. Holcomb, U.S.N.; Raymond B. Fosdick, chairman of the commission on training camp activities; Asst. Surg.-Gen. J. W. Kerr of the Federal Public Health Service; and Surg. William H. Frost, director of the Red Cross Sanitary Service.

WAR NOTES.

Typhoid Fever in the Navy.—According to the report of Surgeon-General Braisted of the Navy, typhoid fever and other communicable diseases have been virtually eliminated from the navy. This is despite the enormous increase in the naval forces. Since the war began less than ten cases of typhoid fever have been reported. Practically the only diseases which have given much concern during the present war have been those of the respiratory type, which are spread mainly by nose and throat secretions, principally mumps and measles.

This is in marked contrast to the experience of 1898, during the Spanish-American War, when the communicable intestinal diseases caused widespread damage and carried with them a high mortality rate. The application of recent medical science has practically eliminated such diseases from the forces afloat and ashore. Such modern methods for the prevention of intestinal diseases include preventive inoculations, the proper disposal of garbage and sewage, protection of food and water supplies from contamination, and the extermination of flies and their breeding-places.

Arrival of Sir Berkeley Moynihan.—The United States Medical Corps is fortunate in having the counsel and advice of Sir Berkeley Moynihan, who has been sent here by the British Government. Sir Berkeley Moynihan is senior consulting surgeon of the British Royal Army Medical Corps and inspector of army camps in France. He arrived in this country on October 18. During his stay he will attend the Clinical Congress of Surgeons in Chicago.

Fire in Camp Hospital.—The receiving ward of the base hospital at Camp Devens, Ayer, was destroyed by fire on October 21. The fire was caused by an explosion of an oil stove, and the flames spread rapidly through the wood and wallboard structure, but without injury to the occupants, who made their escape.

War Relief Funds.—On Oct. 27 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$275,653.69
Armenian-Syrian Fund	240,667.54
Surgical Dressings Fund	127,934.99
French Orphanage Fund	124,976.72
Red Cross Fund	82,812.82
Russian Refugees' Fund	43,037.74
La Fayette Fund	32,491.03
War Dogs' Fund	1,624.25

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending October 20, 1917, the number of deaths reported was 195, against 229 last year, with a rate of 13.16, against 15.68 last year. There were 39 deaths under one year of age, against 34 last year.

The number of cases of principal reportable diseases were: diphtheria, 73; scarlet fever, 26; measles, 41; whooping cough, 16; typhoid fever, 2; tuberculosis, 58.

Included in the above were the following cases of non-residents: diphtheria, 16; scarlet fever, 6; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 9; measles, 1; whooping cough, 1; tuberculosis, 10.

Included in the above were the following non-residents: diphtheria, 5; measles, 1; whooping cough, 1.

Massachusetts State Nurses' Association.—The autumn meeting of the Massachusetts State Nurses' Association was held on October 27, 1917. The morning session was conducted by the Massachusetts State League of Nursing Education. The afternoon session was opened by the Private Duty Nurses' League. Miss Susan M. Cooke read a paper on "A Journey to Russia," and Miss Annette Fiske read a paper on "What the Waltham Nurses Are Doing in Europe."

Through the American Nurses' Association and in accordance with a request from the General Medical Board of the Council of National Defense, the Massachusetts State Nurses' Association has undertaken a survey of the nursing resources of this state. To this end a letter, enclosing a card for registration, has been sent to all nurses in institutions, in alumni associations, training schools and directories and also to those who have taken Red Cross home nursing courses, asking that they fill out the card and return to the Association. The letter states that this survey is a war emergency measure and can be accomplished only by the loyal coöperation of each and every member of the nursing profession in Massachusetts.

Appointment of Athol Physician.—Dr. Benjamin W. Gleason of Athol, Mass., has been commissioned captain in the medical corps of the regular army. He expects to be sent first to Fort Benjamin Harrison and then to France. Dr. Gleason is a graduate of the University of Pennsylvania.

Graduation of Nurses at Brigham Hospital.—There were graduated from the Peter Bent Brigham Hospital on October 26, a class of 27 nurses. The exercises were held in the evening at eight o'clock, and were followed by a reception.

North Berkshire Medical Association.—The regular monthly meeting of the Medical Association of Northern Berkshire was held in North Adams on Tuesday evening, October 16. Dr. A. J. A. Hamilton of Boston read a paper on "Stomach and Intestinal Lesions," illustrated by stereopticon pictures of x-ray findings and operative technic.

Massachusetts Women's Hospital.—The remodeling and refitting of the Massachusetts Women's Hospital on Parker Hill, Roxbury, is completed and it has been opened for the reception of patients. Miss Zillah McLaughlin, formerly superintendent of the New England Deaconess Hospital, is in charge and the staff includes Dr. Charles Hare, Dr. Edith M. Brooks, Dr. Ernest B. Young and Dr. Henry T. Hutchins. In response to a request from the Government, the trustees have offered the service of the hospital for the use of women in Government employ who require treatment not to be had at military hospitals.

Licensing of Dispensaries.—Michael M. Davis, Jr., director of the Boston Dispensary, in advocating a license system of the medical dispensaries of Boston, states his reasons as follows:

"Twenty-five to thirty well-established and reputable dispensaries exist in Boston, treating fully 200,000 men, women and children annually. They are, to a large extent, the poor man's doctor They are also supplying the services of specialists to wage-earners and others of small means who may have their private doctors in ordinary circumstances, but who cannot afford the surgeon, the oculist, the throat specialist, the orthopedist, etc.

"Fattening upon the needs which these public service institutions are trying to meet, there have grown up a few dispensaries conducted for profit, and also some conducted nominally as charities, but really for the support of those who are their officers or managers. Any institution which publicly offers medical treatment to the people should submit to some definite form of public regulation and inspection.

"The law of Massachusetts, as administered by our State Board of Charity, already furnishes a measure of protection against the improper use or solicitation of charitable funds, but there is no public body now authorized to license and inspect dispensaries in order to see if they are reasonably equipped to treat disease, that the arrangements are not such as will disseminate contagion, and that the physicians on their medical staff are legally entitled to practice. A license should be required for every dispensary; the licensing authority should have power to outline reasonable sanitary and medical conditions for the conduct of dispensaries, and to revoke or refuse to renew a license when necessary, after a hearing; and regular inspection should be provided for.

"Profiteering out of the misery of the sick poor, or providing treatment under unsanitary conditions, should not be tolerated. The prosecution of evil-doers will be occasionally necessary under any conditions, but continuous public regulation would prevent most evil-doers from attempting to enter the field at all."

Bristol County Tuberculosis Hospital.—Talaquega Park, in Attleboro, Mass., has been the location chosen for the erection of the Bristol County Hospital for the tuberculous. The State Department of Health sanctioned the purchase of this site. Its existing buildings, which were used as a summer resort, will permit remodeling into permanent structures. The cost was about $75,000.

Boston Dispensary Evening Clinics.—The managers of the Boston Dispensary have voted to open clinics on Monday and Friday evenings for wage-earners who cannot give up their work during the day. This new service will be general, and in addition to the throat, skin and genito-urinary clinics now maintained at the Dispensary. Charles F. Weed, William Power Blodget, Robert W. Maynard and Miss Ellen F. Emerson have been added to the board of managers.

NEW ENGLAND.

Charitable Bequests.—By the will of the late Sarah M. D. Gardner, widow of Judge William S. Gardner of Boston, the Rhode Island Hospital receives $25,000, and the American National Red Cross, $1000.

New England Surgical Dressings Committee.—The Surgical Dressings Committee, with its headquarters at the Peter Bent Brigham Hospital, has become an auxiliary to the Red Cross. It will continue its activities as heretofore, but will open, in addition, a workroom at 236 Beacon Street. Funds are urgently needed and may be sent to the Committee in care of the Old Colony Trust Company, 17 Court Street, Boston.

The Massachusetts Medical Society.

NOTES TAKEN AT A HEARING BEFORE THE SPECIAL COMMISSION ON SOCIAL INSURANCE AT THE STATE HOUSE, BOSTON, SEPTEMBER 26, 1917.*

Dr. Sweetsir of Merrimac: We haven't any laboratory or x-rays in our little town; we haven't a whole lot of these clinical things that we would like, but every practitioner in Massachusetts who is successful, even in the little towns, surrounds himself with his eye man, with his nose and throat specialists, his ear man, x-ray man, and surgeons, and he is perfectly competent,—much more competent than the patient,—to know when the patient needs that service. We have all these things at our command. If an x-ray is needed, an x-ray man comes and takes one if the patient can't go to the office. If I have some tonsils to be taken out, or some ear work to be done, my patient is taken to the one who does that work, or the specialist comes to us. And he does that for what I say the patient can pay. If I send to him patients who can pay, he is coming for nothing if I have a patient who can't pay; and I have no one who takes issue with that stand. I feel that my clientele are taken care of very well and have no need of any legislation to help them out. I am open to any suggestion that will help me or the patient, and when anybody brings that suggestion to me or to the Society, I will accept it and work hard for it.

"Is the cost of medical care and attention beyond the reach of the ordinary workingman today?" That is best answered, I think, by stating that 80% probably pay their bills in full to me. Now that doesn't mean that one man pays me the same as another. If my arm were broken, I would be perfectly willing and feel able to pay a bill of $100 or $200 to have it taken care of properly; but that would be out of the reach of a man earning $18 a week, with a family of children. His fee would be entirely different from that. When it comes to the poor, what are you going to do? What would I do if called to a washerwoman with three or four children, earning her living, if I found one of the children suffering from acute appendicitis and needing surgical attention? It would be too far to take her to the Haverhill Hospital, which is the nearest one. I would go to the overseers of the poor and tell them I had a child down there who needed a surgeon and I wanted her taken care of. The overseers would say, "We don't want anybody to suffer; get your surgeon and the town will pay for it." And I get the surgeon and I apparently get better results than they do at the ordinary general hospital.

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* The remarks of other physicians at this meeting appeared in the Journal October 25, 1917, p. 603.

"How can the State aid further in extending the work of preventive medicine?" You have the State Board of Health, and it is their business to attend to it.

Rep. Greenwood: If we have any instructions to give the Board of Health we can instruct them. Perhaps the thought is to put it under their control.

Ans. As I say, I would be very glad to support any suggestion that was practical along any of these lines.

Rep. Greenwood: Suppose a dispensary were established in Haverhill or Newburyport; would that be advantageous?

Ans. Then would come in the personnel of the clinic. What is the ability of the medical men who are there? I have seen a whole lot of dispensaries where I wouldn't want any of my family treated. If you propose to establish a dispensary in all the larger or smaller centers, under the supervision of the State, how practical would it be from a financial standpoint?

Rep. Greenwood: Whether the people are benefited in their health would be the idea.

Ans. Is it your idea that it shall be a privately conducted thing, run by the board of health, or special committee? If you can empower the State Board of Health to give me a dispensary where I can send in and get x-ray plates free of charge for people who need them (they get them now), it might be an advantage. But they get this now; we all have our charity work to do. I have widows whom I don't even charge because it isn't worth while.

Rep. Greenwood: This would, to a certain extent, relieve you of that.

Ans. I don't think so. We all have our clientele of poor people. I look after it as a part of my business. I wouldn't tell a poor woman, "There is the place for you; I won't go any further with you." Besides, she may have a brother or somebody who has paid me hundreds of dollars.

Sen. Brown: From your remarks, I glean that you don't use the hospitals for your patients very freely.

Ans. I use a good many. I send patients to the Hale Hospital in Haverhill, and to the Anna Jacques Hospital in Newburyport; I send many people to the wards in the Massachusetts General Hospital people who cannot afford to pay for their illness. Supposing I have a man with a hernia; the operation to put it back would cost from $50 to $100, and $50 to $75 for a trained nurse, and more for my care. The Massachusetts General Hospital has always seemed perfectly willing to take such a man and operate on him free of charge. Perhaps he may not be in such straits and can pay first cost of $12 or $15; then he is put in a pay ward; but he couldn't afford to pay his surgeon or nurse. If we say he is able to pay his board, they are perfectly willing to take him, and glad to get him.

The point I want to make is this: that, so far as I know, in our rural community, there isn't a man, woman or child that suffers for lack of medical attendance, medical nursing, or medical care.

Rep. Greenwood: Do you have manufactories in the town?

Ans. The principal business is the making of automobile bodies—Judkins

Rep. Greenwood: Do they have any system of doctoring their help?

Ans. We haven't any business that is big enough to employ private physicians. There are a large number of accidents in the machinery. Those injured are allowed to go where they choose.

Population of the town is between two and three thousand.

Dr. S. H. Calderwood, of Boston: I represent the Massachusetts Homeopathic Hospital. Our Society feels that this is a great step; a step in the dark, perhaps. We feel as physicians that we are doing a great deal for the sick and for the poor sick, and that perhaps we know more about the poor sick man than members of the laity of this committee, and we simply ask you to give this matter a very thorough consideration before any step is taken, because we do feel that it is a step in the dark.

Chairman Wilson: You have an out-patient department in connection with your hospital?

Ans. We do. I do not know how many we take care of there, but I can send you the figures.

Our society covers the ground in the same way as the Massachusetts Medical Society.

Rep. Washburn: Have you any constructive suggestions to make with reference to any bill which possibly might be brought in by me alone?

Ans. I have no suggestions personally, for I have not studied the matter much.

Rep. Washburn: Do you think the State could pay money in any way to stimulate the people on healthful living and knowledge of the bacillus?

Ans. I see no need of it at the present time. The medical profession is doing it well; there has been a great advance in the last ten years especially, and I see no reason why the State should assume an enormous bill for it.

Dr. Stone introduced Dr. Hurley, a nose and throat specialist, who was a panel doctor in Austria.

Dr. John J. Hurley, of Boston: My first objection to this proposed compulsory health insurance (and I was one of the original objectors) is, that while we are making an intensive study of compulsory insurance, we have also got to make a study of the 14th amendment to the United States Constitution. I do not believe a public health bill can be gotten up and passed that squares with that amendment. I think it is special legislation for a special class.

Taking up the merits of the question very briefly: my somewhat extended experience under the Austrian act has shown me very definitely that compulsory insurance is not a road to immortality. The undertakers are doing the same amount of business. It has caused politics to enter into the medical profession; and if there is any reason why politics should be kept out of the public schools, it is doubly true that they should be kept out of medicine.

One gentleman this morning spoke of the "mediocre doctor." What is a mediocre doctor? He said that certain people were turned away from the services of eminent men at the Massachusetts General Hospital, and on that account would "have to go to a mediocre doctor." If the diplomas of the chartered medical schools are worth anything, there are no mediocre doctors. There are specialists, but the so-called "mediocre doctor," if by that you mean a general practitioner, is perfectly able to take care of these patients, for he is at liberty to call on the so-called "eminent men" of the profession

Dr. Edmund F. Cody, of New Bedford: Last June at the annual meeting of the American Medical Association, one afternoon in the Section of Preventive Medicine was given over to the subject of compulsory health insurance. Irving Fisher read the leading paper on the subject, and Mr. Hoffmann, a statistician, read the leading paper on the other side. After full discussion and careful consideration of the subject, the Section on Preventive Medicine voted to instruct its delegate to the House of Delegates to oppose the scheme for public compulsory health insurance in every way possible. There were representatives from all the states in the Union. Sitting next to me was a gentleman from China, and he said if he went back at the end of his leave of absence (he is head of the Y. M. C. A. in Shanghai) and took word to his co-workers that health insurance has been endorsed by the Americian Medical Association, in his opinion it would be the most severe blow that progressive medicine could receive in China.

Massachusetts has contributed to preventive medicine in the United States; for instance, the introduction of vaccine (without pay). At the Massachusetts General Hospital, ether was first given to the world; Bigelow crushed stone in the bladder, and reduced dislocation of the hip joint. These things were done without charge and without legislative supervision. At the Sharon Sanatorium, Dr. Vincent Y. Bowditch has demonstrated to the world that the person afflicted with tuberculosis can be cured in our own climate. This has been followed by state and municipal and village sanatoria throughout the world. It was demonstrated to Massachusetts without cost. Diphtheria antitoxin was given by Massachusetts. It was Dr. Harvey of up-State who wrote into our laws the law of putting free textbooks into the hands of the children of Massachusetts.

In the month of June, 1914, our ambassador to the Court of St. James accepted the presidency of an organization to ameliorate the condition of the poor by establishing mortuaries so the bodies could lie apart from the living during the period between death and interment. The need arose because of the 10,000 single-room tenements and 5000 underground tenements.

Rep. Washburn: Have you any constructive suggestions to make?

Ans. I don't believe in ringing in the alarm until we need it. In Massachusetts there has been no health survey; there has been no epidemic, no unusual mortality which invites immediate action. New Bedford is a cotton city, and several years ago the Massachusetts Board of Labor and Industries made a request to somebody—I think, the State Commission on Health—that the physical condition of minors in the cotton industry should be investigated. Dr. Safford—a very skilful statistician—was detailed, and he made a search of the conditions in mills, large and small, all over the State. He made a comprehensive report that included every possible phase of childhood and age in the cotton mills. He had one suggestion to make: that in all the cities and towns, adequate facilities should be afforded where the citizens could receive proper dental care.

I do not see that Massachusetts at the present time is suffering from any particular physical deterioration that demands specific action along health insurance. Regarding clinics in various parts of the State, I think they are very necessary, but the matter has not been thoroughly investigated.

Rep. Greenwood: You think there is room for some investigation of that psychopathic work?

Ans. Yes; really the institutions are crowded, and a number of people who are applying should be under care in the early stage. They get by the doctor just as tuberculosis did years ago; we don't recognize the early stages of mental disease.

BRIEF REPORT OF THE HEARING ON HEALTH INSURANCE BEFORE THE MASSACHUSETTS COMMISSION ON SOCIAL INSURANCE, AT LAWRENCE, OCT. 10, 1917.

By W. H. Merrill, M.D., Lawrence, Mass.

Senator Herbert A. Wilson: We are going to give the first hour to those in favor of health insurance. We will first be glad to hear from any one who represents any organization which goes on record as in favor of health insurance, if there is an individual who has anything to say in favor of health insurance, and after that hour is up, we will hear any one who has come in late, and has been either in favor of or against health insurance.

Mr. Matthew Burns said any system should be of such a form that a lawyer's advice should not be necessary for the workman to obtain its benefits; that the decision of a competent physician should be sufficient.

Mr. Julius Gens, real estate dealer, inquired if the proposed laws were to be like those in Germany. He said he was pro-German and favored such laws.

Mr. James R. Menzie, a prominent official of the labor union, said labor was not opposed to the principle of health insurance, but was opposed to compulsory contribution by the workman; that the community as a whole should pay all of the expense; said that many of the unions had benefit insurance, paying both sick and death benefits; workingmen were also insured in fraternal orders.

Mr. Michael O'Brien, representing Allied Trades Unions, said that tonight the representatives of the unions went on record as opposed to contributory health insurance. They were not opposed to the principles of health insurance; they would not oppose a bill compulsory upon the state and employer, but optional with the employee. He favored contributory old-age pensions.

James A. Donovan, attorney for the Allied Trades Union, was present at the convention of the American Association for Labor Legislation, when the matter was first discussed, and followed with interest its various phases. Neither he nor his clients believe in compulsory contributory health insurance, and believe that some of its provisions would be very detrimental to the interests of labor; among these were the cataloging and card indexing of employees, which would be used by a large association of manufacturers. This was already being done by the metal trades.

Dr. W. J. Sullivan, city physician, favored contributory old-age pensions and various forms of relief of the poor which would not have any stigma of charity attached to them. He said the ill and poor of Lawrence did not suffer for necessaries of life or medical attendance. He neither favored nor opposed health insurance, but if adopted should be contributory and administered directly by the State.

Dr. M. F. Sullivan favored health insurance.

Dr. F. D. McAllister: I came here this evening especially in order to receive instructions, rather than expecting to offer much of anything. In the notice which I received of this meeting a question was asked as to what extent poverty was due to illness. It is a very difficult matter to make up one's mind exactly. What sort of illness is considered in health insurance? If we rule out old age, illness is caused in the first place largely by ignorance, by intemperance, and so-called occupational diseases; even the classification under the occupational type is obscure. At the Lawrence General Hospital most of the cases are general diseases that could not properly be classed as occupational, such as pneumonia, typhoid fever, and all constitutional diseases that do not belong to occupation. It is very difficult to form an opinion as to how extensively real poverty is the result of a disease. I have been very much in doubt as to the causation, except in old age and in accident cases.

In the case of any form of health insurance, it seems to me that the people who expect the benefit ought to contribute. Exactly the basis of their contribution I cannot say, but the moral question is a question of right and wrong; it is a question of fair dealing, and I repeat, it seems to me that people who are to receive a benefit should pay for it in some form or other. I belong to an organization that pays benefits during illness. It is universally accepted, this benefit, whether the beneficiary needs it or not, simply that all may feel unembarrassed, and it seems to me that if one is to take it, all should take it. I certainly hope that any proposed act will be better managed than the Workmen's Compensation Act has been; that the patient may have the choice of his own physician; that the State shall do the insuring, and not a private company; that it shall be a state organization, where doctors may have some chance of fair dealing; where a man's bill shall receive some consideration; where fair treatment can be reasonably expected, without humiliation,—a difficulty under the Compensation Act. Some insurance companies are very fair and honorable, and others are exactly the opposite, and well-meaning physicians have suffered a great deal.

Rep. Brogna: May I ask you this one question? You have stated illness is caused by ignorance, intemperance and occupational diseases. Did you put those intentionally in this order according to the number of cases?

Dr. McAllister: I think that would be a fair way.

Rep. Brogna: In other words, intemperance belongs in the second place or first place.

Ans. Yes.

Rep. Brogna: You mean to say, Doctor, there are more diseases caused by intemperance than by occupational diseases?

Ans. Yes, in my experience, for it undermines the constitution. I put ignorance first. I placed them in that order intentionally; they occupy that place in my mind.

Rep. Brogna: You mean there is less illness of occupational diseases. Does any disease peculiar to the mill operative occur in Lawrence?

Ans. Wool-sorter's disease, anthrax.

Rep. Brogna: What does it affect?

Ans. The hands and face; it is a very fatal disease. You will see that it is not a common disease.

Rep. Brogna: Is there a disease more peculiar to the mill operative than anthrax?

Ans. Not to the ordinary mill operative that we have here that I know of. There are very few strictly occupational diseases which we have to deal with in Lawrence.

Rep. Brogna: Are many of the mill operatives in your knowledge anemic, the anemia caused by occupation?

Ans. I couldn't say; it would be difficult to say accurately to what the anemia is due, but there are a great many that are underfed and improperly clothed, and are taking very poor care of themselves because of lack of knowledge. A great many of the girls go without any breakfast.

Rep. Brogna: Do you know whether that is because of ignorance or necessity?

Ans. Because they don't get up early enough in the morning. I just mentioned that as a matter of fact. I have been called into the mills, and so have other doctors here in Lawrence to see girls who were suffering from lack of nutrition, who were out late the night before, and got up late in the morning and didn't have time for breakfast. That is a habit of their lives. They have anemia.

Mr. Everett Morss, Esq.: I am going to ask a question that we have heard before. You spoke of the Workmen's Compensation Act, the unsatisfactory time the medical profession had with it, that some companies were quite different from others; the so-called Massachusetts Company changed to the Liberty Company, that was the company organized by the authority of the State, and there are one or two other mutual companies on the side, and I'd like to ask whether the experience with the Massachusetts Company is quite different?

Ans. Yes, it has been in my experience.

NOTES FROM THE DISTRICT SOCIETIES.

District Correspondents.

Berkshire, A. P. Merrill, M.D., Pittsfield.
Bristol North, Arthur R. Crandell, M.D., Taunton.
Bristol South, Edwin D. Gardner, M.D., New Bedford.
Essex North, T. N. Stone, M.D., Haverhill.
Essex South, H. P. Bennett, M.D., Lynn.
Hampden, Laurence D. Chapin, M.D., Springfield.
Hampshire, E. E. Thomas, M.D., Northampton.
Middlesex South, William C. Hanson, M.D., Belmont.

Worcester North District Medical Society.—The second quarterly meeting of the Worcester North District Medical Society was held at the Chamber of Commerce Hall, Fitchburg, Tuesday, October 23, at 1.30 p.m. The speaker was Dr. John T. Bottomley, of Boston.

C. H. Jennings, *Secretary.*

Miscellany.

RESOLUTIONS ADOPTED AT MEETING OF NORFOLK SOUTH DISTRICT MEDICAL SOCIETY, THURSDAY, OCT. 4, 1917.

A Memorial.

Edwin Nelson Mayberry, M.D.,
1858–1917.

Dr. Edwin N. Mayberry was born February 18, 1858, in Edgartown, Mass. He graduated from the Medical Department of the University of Vermont in 1882. Practicing for a time in Saugus and in West Warren, Mass., he soon moved to South Weymouth where he found his life work and rounded out a professional career of thirty-two years. He died July 15, 1917, after a prolonged illness.

Conscientious and painstaking in all his work, he gave his whole strength to his profession and was thoroughly absorbed in it. His contact with the sick was marked by great kindness and consideration and by a sympathy which he bestowed upon them to an unusual degree. These traits greatly endeared him to his patients and to the whole community.

Constant in attendance at medical meetings, he kept in close touch with his associates. He also gave freely of his time to advance the interests of his profession and maintain its standards. Dr. Mayberry will be greatly missed by the community which he served and by all who knew him. He will be particularly missed by the Norfolk South District Medical Society, of which he was a most helpful member, and its president in 1912 and 1913. His memory will long be cherished as that of an earnest, wise, faithful and sympathetic physician and friend.

Oliver H. Howe, M.D.,
W. A. Drake, M.D.,
John C. Fraser, M.D.,
Committee on Resolutions, Norfolk South District Medical Society.

August 1, 1917.

POLIOMYELITIS IN NEW YORK CITY IN 1916.

An excellent and critical summary of our present knowledge of poliomyelitis is that prepared by a joint committee representing the Public Health Committee of the New York Academy of Medicine and the New York Neurological Society, and published, far less prominently than it deserves, in the *Medical Record* of September 15th, under the heading "Society Reports," and reproduced as follows in the Bulletin of the New York Health Department for October 6, 1917.

"The report of this committee is based on a critical consideration of the testimony before the committee of a large number of experts, including clinicians, epidemiologists, laboratory workers and others. The committee endeavored to find out what has been added to our knowledge of this disease through the studies and experiences of the past year, both in clinical fields and in the laboratory.

"According to the report, 'the "globoid bodies," described by Flexner and Noguchi, 1913, seem to bear a definite relation to epidemic poliomyelitis....... In general, they follow Koch's law of causation; they have not been detected in lesions or conditions other than poliomyelitis; they have reproduced the disease experimentally in monkeys, and they have been recovered from lesions thus produced.'

"After discussing the very considerable natural (or acquired) immunity to infantile paralysis, the conclusion is reached that 'these facts seem to indicate that the natural immunity is not due to a great prevalence of abortive or unrecognized attacks. It is more likely that this immunity is of the same nature as the natural immunity against diphtheria.'

"Chief interest, of course, centers in the problem of communicability. We therefore reproduce this part of the Committee's report in full:

" 'Poliomyelitis is a communicable disease. It is mediately contagious, and slightly immediately or personally contagious. This slight personal contagiousness of the disease seems, from the facts brought out in the last year's epidemic, a thing to be strongly emphasized.

" 'If the Committee's interpretation is wrong, it will have to be shown by further and more careful studies of this phase of the question. Our views are based on the facts given in detail by Dr. Tilney in the appendix. Some of these data are:

" '1. That only a small percentage of cases have been shown to have arisen from personal contagion, and in many of these there is not so much proof as inference.

" '2. That the great mass of the cases arise without any history of personal contagion.

" '3. That multiple or family cases make up only about three per cent., and in more than half of these the members of the family were attacked at about the same time or not sequentially.

" '4. That uninfected and healthy children placed in wards containing infected cases do not take the disease.

" '5. That in an epidemic (summer of 1916) in institutions caring for children and offering a fair mark for the disease, there was no infection except in a few instances. That in day nurseries in New York City, babies brought from their homes for the day and taken back at night, were not infected.

" 'That in urban and rural populations the number of cases per 1000 is greater in uncrowded country districts than in the crowded city.

" '7. That the small number of cases of personal contagion is not explained on a theory of very high prevalence of natural immunity.

" 'On the other hand, there are cases which show, as plainly as clinical evidence can show, that personal or immediate contagion can occur. Although it is slight and the immunity rate is high, yet its existence must at present be reckoned with. We only wish to emphasize its small absolute importance, and to urge against burdensome quarantine restrictions based on views of its importance.

" 'An infected person, however, can probably communicate the infectious organism to certain agencies, thus making these agencies carriers of the disease. These carriers may be human beings or certain of the lower animals, food, dust and dirt. No insect or animal has been positively identified as the ordinary and active carrier in the spread of the disease, and there is not, as yet, any practical method to detect a human carrier.

" 'The evidence that the germs are carried about by agencies which spread the disease is based on many clinical and experimental observations. It seems possible that certain changes occur in the infecting organisms which make it possible for the carrier to transmit the disease, while the infected person does not.'

"Concerning the specific serum treatment of the disease, the report says: 'The statistics of these observations, while extremely suggestive, fail to bring conviction that a specific remedy for this disease has been discovered.' The intraspinal administration of adrenalin is declared to be 'still in the experimental stage.'

"Prophylactic measures, such as spraying the nose and throat and gargling, are deemed not only unavailing, but objectionable, if not injurious, in infants. 'They may tend to make the mucous membrane of the upper air passages more perilous to the microörganism of the disease.' "

* * *

DR. SEDGWICK OF M.I.T. URGES SANITARY STUDIES.

Prof. Sedgwick, who has just returned from a considerable stay in Washington, reports the keenest interest on every hand in the speeding up of technical education, and the extensive recruiting of young men and women for the various technical professions affected by the war. Among other interesting developments, he reports the rapid formation of the Sanitary Corps of the Medical Department of the Army, which is being recruited largely from non-medical sanitarians, such as sanitary engineers, sanitary chemists, sanitary biologists, and trained laboratorians.

Another interesting development is that of the Bureau of Sanitary Service of the American Red Cross, of which Dr. W. H. Frost, a high official of the U. S. Public Health Service, has been appointed director.

The sanitation of the various cantonments, prison camps, and other bodies under military control, naturally rests with the army, while the training stations for the navy are similarly in charge of the medical department of the navy. Military control stops, however, with the actual border of the cantonments, camps and the like, and the legal responsibility for the sanitation of the zones just outside rests upon the state, county, town or other authorities. In many instances, local, county, and even state officials find themselves swamped by the multitude of new problems thrust upon them by the unusual concentration of military population, and it must be obvious to anyone that the care of these circumcantonal zones is a matter of gravest public interest. This is where the U. S. Public Health Service and the Bureau of Sanitary Service of the American Red Cross stand ready to lend their aid, and it is interesting to know that a bill has long been pending in Congress providing for the establishment of a Sanitary Reserve in connection with the U. S. Public Health Service, intended to enable that Service to employ sanitarians not already in its service, such, for example, as experts in bacteriology in our colleges, and non-medical sanitarians. Unfortunately, this bill has not yet been passed, and it is by no means certain that Congress will be able to act upon it at the present session, which is naturally becoming crowded with important matters as it draws to a close.

It is just here that the Bureau of Sanitary Service of the American Red Cross bids fair to be exceedingly helpful, for this Bureau stands ready upon the request of the U. S. Public Health Service, or of any state, county or municipality to establish within the circumcantonal zones, sanitary inspection, sanitary laboratories, and even sanitary supervision for the testing of milk and water, for aid in tracing and controlling epidemics, and for other sanitary work which may be required. Already, on the request of various local authorities, the U. S. Public Health Service and the Bureau of Sanitary Service of the Red Cross have provided men and women inspectors, public health nurses, and even, in a few cases, fully equipped laboratories, to carry on this important work for preventive sanitation.

To supply the personnel required in the Army Sanitary Corps, the U. S. Public Health Service, and the Sanitary Bureau of the Red Cross, a much larger force of young men and young women than is now prepared is required, and Prof. Sedgwick feels strongly that medical schools and departments of bacteriology, public health, hygiene, sanitation, etc., in our universities, colleges and technological schools must in the first place "speed up" in order, perhaps, to turn out their annual product more quickly than usual, precisely as Annapolis and West Point are already doing, and also that the public must lend a hand by advising young men and young women, whose tastes or inclinations point in these directions, to enter at once upon active preparation for the positions which almost certainly await them, both now and in the future.

The problem of the sanitary protection of the civilian population in times of peace is no less pressing than in time of war. It may, even, be more urgent, because after the war is over, the regular supply of sanitarians will be depleted, lasting burdens of poverty and ill health will be laid upon the population, and those diseases which war and the reduction of vital resistance promote through anxiety, underfeeding and the like, will be heavier than ever. He believes that it is the duty of all educational institutions which are in a position to lend a hand, to do what they can toward turning into the ranks of the technically trained a large force of men and women who shall fill the gaps that are already opening wide in the ranks of the workers. Sanitary engineers, sanitary chemists, and sanitary biologists are already in great demand, with a wholly inadequate supply in sight.

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PROGRESS IN COMBATING HOOKWORM.

The recently published annual report of the Rockefeller Foundation records the results of intensive work on the study and control of hookworm and malaria. The report states:

"During the year 1916 the work of the International Health Board continued to be directed chiefly toward the relief and control of hookworm disease. In coöperation with the government, systematic efforts toward control have now been inaugurated in eight of the Southern states and in fifteen foreign countries, located between degrees of latitude 36 north and 30 south in the tropical and sub-tropical belt, which is the native habitat of the hookworm. New fields of operations in 1916 were Salvador, Brazil, Ceylon, and Siam. Arrangements were also completed to start work early in 1917 in the Fiji Islands, in Papua, and in Queensland, Australia.

"In British Honduras and the island of Barbados, preliminary infection surveys were made, and in the Yangtsekiang valley of Central China a preliminary survey was carried out with special reference to the problem of soil pollution in shallow mining operations.

"The board conducted during the year a series of four experiments in malaria control. Three were finished. The fourth will be completed in 1917. The object of all four experiments was to determine the degree to which malaria could be controlled within the limits of reasonable expenditure and under conditions prevailing in typical farm communities of the South. Gratifying results have been obtained.

"Two commissions were sent to South America. One, composed of six sanitarians, with Maj.-Gen. William C. Gorgas as chairman, visited the republics of Ecuador, Peru, Colombia, Venezuela and Brazil, to study yellow fever conditions. Two definite objects were sought: (1) to determine the status of doubtful endemic centres of infection; (2) to ascertain what measures were necessary and feasible to eradicate the disease from the localities responsible for its dissemination. The second commission investigated medical education and public health agencies in Brazil.

"Active measures to control and prevent hookworm disease are now in operation in Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia; in Antigua, Grenada, St. Lucia, St. Vincent and Trinidad of the West Indies; in British Guiana and Dutch Guiana; in Costa Rica, Guatemala, Nicaragua, Panama and Salvador of Central America; in Brazil, and in Ceylon and Siam of the Far East.

"Four experiments in malaria control were carried out during 1916 at different points in the Lower Mississippi River Valley. In each a different line of investigation was pursued, the object being to discover a practical method of control which the average rural community could afford.

"An experiment was conducted under the administration of the Mississippi Department of Health, with Dr. W. S. Leathers as administrative director and Dr. C. C. Bass of Tulane University as scientific director. The practicability of control through detecting the carriers and freeing them of the malaria parasites was tested. The experiment covered 225 square miles of territory, the size of the communities varying from nine to sixteen square miles, with an average population of 1000. Adjoining communities were taken up, one after another, as facilities permitted, the work in each lasting about four weeks with subsequent visits to insure thoroughness. Blood tests were taken, quinine treatment was given to those found infected. The experiment will be continued in 1917."

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COST OF HEALTH SUPERVISION IN INDUSTRY.

A pamphlet compiled for the Conference Board of Physicians in Industrial Practice, by Magnus W. Alexander, regarding the cost of health supervision in industry, makes the following statements:

This is the second compilation of the Cost of Health Supervision in Industry, made for the Conference Board of Physicians in Industrial Practice.

The first compilation was published in October, 1916, and comprised data, mostly for 1915, submitted by forty-one industrial plants, with an average of 223.416 employees. The average annual health supervision cost, as then reported, was $1.88 per person. The lowest cost ($0.53) was reported by a metal trades plant employing 385 persons, the highest ($7.79) by a paint factory employing 2448. Some of the reports, however, were approximations only, based on more or less incomplete records or on a short experience while the work was in its infancy. It was, therefore, decided to make a new compilation, based on longer, more varied and more mature experience.

The details of the later compilation present data for the year 1916 as reported by ninety-nine industrial plants located in fifteen states. The total average number of employees represented was 495,544; the average number per plant was 5005, the maximum 37,107, the minimum 141.

While the average cost per person is $2.50, it is not representative, as the total cost on which the average is based includes that of four plants which render unusual service, giving both medical and surgical attention to their employees at the plant and in their homes as well, besides assuming the medical care of employees' families. Omitting these four plants from consideration, the average cost for the 479,634 employees in the other 95 plants was $2.21.

Where the average cost appears to be unusually high or low, the reason is in many cases indicated in the table itself. The size and character of the medical staff is usually the determining factor. In some cases, the cost is influenced greatly by the number of injuries treated in private or public hospitals, in others by the amount of care given to all injuries whether serious or slight, or by extension of the service to include physical examination of all employees, treatment of sickness of employees at the plant and at home, and even by medical care of employees' families, or by a combination of all these features.

The cost is also influenced, of course, by the kind of work done in particular plants and by the character of the industry. Shops doing very light work, with little hazard exposure, naturally have fewer and less serious accidents than those doing heavy work, particularly where there is much overhead handling of materials, or where many men work in elevated positions, as in the power and light industry. The cost in plants manufacturing chemicals and paint reflects the great care exercised to safeguard the health of workers in those industries.

A total of 3,165,114 cases was reported, an average of more than six cases per person employed, at an average cost of $0.39 per case. The number of cases reported, however, does not include all of the service rendered. In many plants, no record is kept of slight injuries, of injuries redressed, of medical cases treated, of home visits made, or of physical examinations. In others, even the most trivial cases are counted. Furthermore, as "cases" are so varied in gravity and in the time required for treatment, any comparisons of costs per case are not of much value.

The "total medical and surgical cost" includes salaries of physicians and nurses, cost of outside medical and surgical service and cost of medical and surgical supplies, whether or not paid for by insurance companies as a part of the insurance contract; it excludes all compensation for injuries, all overhead expenses, and any wages paid to employees while off duty to have their injuries treated.

The aim of this compilation is to inform employers of the actual cost of health supervision of employees in different industries. To this end, the data were secured from plants engaged in many industries, in light, medium and heavy work, in comparatively safe as well as hazardous operations, and in shops of various sizes and character, located in various parts of the United States. Some are situated in cities where hospitals and specialists are available, some are in small places where such service can be secured only at considerable expense and delay. With the large variety of experience to choose from, each employer can obtain data which will give him a fair idea as to what such service would cost in his own plant.

The chief significance of these data, from a general viewpoint, is that it is possible to give such a large amount of medical and surgical service at a cost which averages only $2.21 per employee per year.

Convincing proof of the economic value of health supervision in industry is afforded by the fact that, when collecting the data contained in this report, it was found that no employer had abandoned the health supervision activities established in his plant. On the contrary, the prevailing tendency has been to invest even more money in extending the service.

SOCIETY NOTICE.

Norfolk South District Medical Society.—Stated meeting at the United States Hotel, Boston, Thursday, November 1, 1917, at 11.30 A.M.

Dr. Archibald M. Fraser, of Boston, will read a paper on "The Dakin-Carrel Method of Treating Wounds" for Dr. F. W. Crawford of Holbrook.

Censors' meeting at United States Hotel, at 2 o'clock, following the Stated Meeting.

F. H. Merriam, M.D., *Secretary*,
South Braintree, Mass.

RECENT DEATHS.

John Quincy Adams, M.D., a Councilor of the Massachusetts Medical Society, died at his home in Amesbury, Oct. 18, 1917, aged 67. He was a graduate of the Bellevue Hospital Medical College in 1872, and had practised in Amesbury since he joined the Massachusetts Medical Society in 1873.

William Caldwell Stevens, M.D., died at his home in Worcester, October 17, 1917, aged 62 years. He was born in Barre, Mass., Dec. 16, 1854, was a graduate of Amherst (1876) and of Harvard Medical School (1883) and served as interne at the Rhode Island Hospital. He was a Fellow of the Massachusetts Medical Society.

Thomas Joseph Henry McCormick, M.D., died of heart disease, at his home in Roxbury, October 10, 1917, aged 42 years. He was a native of Boston, a graduate of Harvard College in the class of 1897 and of Harvard Medical School in 1900. He is survived by his widow, who was Miss Mary E. Donnelly of South Boston. Dr. McCormick was a Fellow of the Massachusetts Medical Society.

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Address.

A PHYSICIAN'S IMPRESSIONS OF FLORIDA.*

By W. L. Johnson, M.D., Uxbridge, Mass.

If any apology is necessary in presenting such a subject at the present time, it is here about to be made. For over thirty years I have listened to the annual orations delivered before this Society and have heard various medical and surgical subjects discussed by the orators of the day. They have all brought some real contributions to medical literature, and in the sum total have traversed the highway of increasing medical lore with constantly progressive steps.

To this creditable progress I can contribute nothing, for I have wandered far from strictly medical fields, and am laden with the products gathered therein. I am simply hopeful that a new subject, presented by one who is an enthusiast on Florida, will not be uninteresting to you, and may perchance amuse you enough to be an excuse for so great a variation from the expected routine of a medical orator. I want it understood, lest you should take anything I may say as absolute law, that these are strictly my own observations, and I have not consulted any books on Florida to confirm or refute any conclusions to which I shall arrive. Consequently they may be narrow in some respects, are sure to be local, and undoubtedly will be disputed by the true Southerner. With these limitations in view, I will plunge into the midst of my subject.

What is the great charm of Florida? Nothing else than its wonderful climate. Nowhere else is the sky so blue, nowhere else is the air so clear, the breezes so soft; nowhere else is there so much oxygen in the air; nowhere else do the cares and perplexities of life fade into nothingness, like the fleecy clouds that sink into the azure depths of the vast unknown; nowhere else does one get that delicious intoxication that has no reaction, that brings to the old and weary the dreams and enthusiasm of youth.

Nowhere else can we get the full significance of the poet's words:

> "Now the heart is so full that a drop o'erfills it;
> We are happy now because God wills it.
> We can shut our eyes, but we cannot help knowing
> That skies are clear and grass is growing."

Lowell says: "What is so rare as a day in June?" Dr. Clark has well answered: "A hundred and twenty days in Florida."

Picture to yourself the most delightful day that New England ever offered, when "to simply live is a sheer delight," and you have a sample of Florida's daily winter weather. Does it not rain? Oh, yes, but we all like rain; but in New England it rains and takes two weeks to clear off, after the rain stops! The "leaden skies" of the poet, so much in evidence the past month, are unknown to Florida. The storm over, the sun appears at once, to make the earth rejoice and the hearts of men glad. Rightly is Florida called the land of sunshine. The editor of the

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* Delivered before the Worcester District Medical Society and the Thurber Medical Association.

St. Petersburg Times gives his paper away every day the sun does not shine. The winter I was there I did not get but one free copy, and last winter he boasts of not having once been called upon for free distribution. Imagine one of the Worcester papers trying to do business on this basis. It was a prim and cultured maiden who said that Boston was her idea of Heaven. To me the Elysian Fields can have no brighter charm than can be seen in Florida today.

How shall we reach this delightful clime? Surely, the best way is by sea. The comfortable ships of the Mallory Line, starting from New York and landing at Key West, leave nothing to be desired. By train there is so much absolutely desolate, uninviting land to ride over, that one feels weary even to think of it. By boat there is a charm from the moment we leave the harbor in New York. The great cakes of ice that bump into the ship as it ploughs along are merely a reminder of what we are leaving behind in the warm and comfortable cabin. Every hour brings us nearer the land of our dreams. The delightful companions that one meets on shipboard, making life-long friends often from an overnight acquaintance, the excellent food furnished, the care and courtesy that the officers of the ship always extend, make even the dreaded Cape Hatteras no more than an incident in the voyage; and soon we are beyond the danger zone and sailing peacefully on calm seas, shedding our winter garments as an unpleasant dream in the reality of the morning.

The third day we reach our destination at Key West, and in spite of the early hour the inhabitants are out in force to bid us welcome. January has faded into the North; June has come overnight. How refreshing are the green grass, the warm sunshine, the flowers blooming on every hand!

A boat load of negro swimmers put off to show their prowess in diving for dimes, and they had plenty of chances to show their skill. In the clear waters around Catalina Islands in the Pacific, where a coin could be traced twenty feet below the surface, this had seemed a real show, but in the dark waters of the Atlantic, it rose to the heights of the wonderful. Hardly a coin was missed, and one bold swimmer dove from the very top of the steamer and caught a silver coin at least ten feet below the black waters, a seemingly impossible performance.

Key West has a good harbor, but it is not an ideal place to live. The enterprise of the other Florida cities seems to be lacking there. Spaniards and Cubans seem to be in the majority, and if it were not for the soldiers at Fort Adams, and for the naval officers at the navy yard, we should imagine we were in a foreign city.

Key West depends entirely upon rain water for its supply, and every house has its little reservoir. After the water has run over the dirty roofs and been sprinkled with the dust of the streets it reminds one very forcibly of the Blackstone River, polluted with the sewage of Worcester. No wonder typhoid fever is very prevalent there, and one thoroughly sympathizes with a visitor who was arrested for drunkenness. Asked by the court what he had to say, he replied, "Well, Judge, I couldn't take any chances on the water, and I didn't know the whiskey was so strong."

Key West is an ideal fishing port, and the catch there is wonderful. Every morning there is an auction sale, after the boats come in, and the quantity and the variety of the fish, and the spirited bidding, makes a very interesting picture to the visitor. Green turtles are here caught by the hundreds, and I never believed there were so many. Green turtle steaks are but ten cents a pound, and are delicious eating. They are shipped alive in large quantities to the North every week, where they are a great delicacy, and the business is a very profitable one. We enjoyed the crawfish in Key West very much. They are like our lobsters in the North, only smaller, and, properly cooked, are fully as good.

At Key West, Northern tourists coming by boat divide, part going up the West Coast to St. Petersburg, Bradentown, and other resorts on the Gulf of Mexico, the other part going up the East Coast, over the wonderful extension of the Florida East Coast Railroad—one hundred and seventy-six miles, seventy of which are over the water! "Flagler's Folly" it was called when it was building, but how much it has meant to Florida! Only a marvellous mind and unlimited capital could have constructed such a road. A million dollars a mile it cost through part of the way, and indeed one wonders how it was constructed at all. In common with many other physicians of Worcester County, I have contributed my mite in gasoline to the Standard Oil octopus. I have received the biggest return on my investment I ever dreamed of, in my ride over this road. It is true I paid for it, six cents a mile from Key West to Miami, five cents a mile from Miami to Palm Beach, and four cents a mile the rest of the way,—the only road I know of having such a varying mileage.

Even my fertile pen will fail to do justice to that ride. Into vast swamps, where the mango trees flourish in tropical profusion, out onto the little keys dotting the water; then over the great concrete arches into the broad Atlantic, where for miles nothing could be seen but water. There is no road like it in America. Such a profusion of brightly colored wild flowers, stretching as far as the eye could see, would be succeeded in a flash by most wonderful colors of the sea, a bright robin's-egg-blue predominating, but every color of the spectrum being visible. Long Key Fishing Camp was reached at noon and here we had thirty minutes' stop. It is a beautiful little oasis in the desert of water; a paradise for sportsmen, with a fine hotel and many pretty cottages. Cocoanut palms grow here in profusion and are loaded with fruit. As we go north from here we reach the solid land, and the homesteads of the pioneer settlers begin to appear. The utter loneliness of these places is appalling,—miles to the nearest neighbor, no road but the railroad. One feels vast sympathy for the women and children who gaze at us as the train passes by. But the wonderful fertility of the soil, the softness of the climate, free from even a touch of frost, will make this section blossom as the rose in the near future. Strange names the stations have—Cudjo, Big Pine, Ramrod, Jew Fish and Rough Rider are some of the regular stopping-places.

With incredible labor, miles of the virgin forest swamps have been cleared, and orange groves and grapefruit plantations have taken their place. The golden fruit flashes in the sunlight, mellowed by the beautiful green of the trees. The air is filled with the delicious odor of orange blossoms; robins, bluebirds and mocking birds flitted among the trees, lending their sweet melody to nature's loveliness. Truly it was worth while to be alive and there.

Soon civilization succeeds the beauty that nature has so freely lavished, and the train reaches the "Magic City"—Miami, the Queen of the South.

And here I must pause to say a word about the patron saint of Florida, Henry M. Flagler. Andrew Carnegie, John D. Rockefeller, Henry M. Flagler, the Standard Oil Trio, large of brain and with boundless optimism,—the greatest of these is the least known in the North. Carnegie has enriched the libraries of the world and added much to literature. Rockefeller has given his millions generously and been a large factor in the world's benefaction. But Flagler made a state out of a desert land, with nothing but the climate to assist him, and has added to the happiness and health of countless thousands. He built the magnificent Florida East Coast Railroad and made "God's country" accessible to a whole nation. With lavish prodigality he constructed the most wonderful hotels in America,—the Ponce de Leon at St. Augustine, the Royal Poncianna at Palm Beach, the Royal Palm at Miami. They tell a story of him there which is characteristic of the man, whether it is true or not. The Ponce was the last word in hotels, and everybody predicted its failure. Its first manager was the best hotel man in America, but he was prudent and careful. The hotel did not succeed as he wished, and he wrote Mr. Flagler that the hotel was losing five hundred dollars a day, and suggesting that the expensive chef be discharged and the orchestra be sent home. Mr. Flagler telegraphed the next day: "Get an additional chef, the best that can be secured, and double the orchestra."

Not alone did Mr. Flagler attract people of wealth and refinement from all over the world to his beautiful hotels, but he did far more. The great freeze of 1895 left Florida a ruin; land could not be given away. Oranges were supposed to be the State's only crop, and the trees were ruined. He demonstrated the fertility of the soil by showing that it was not a one-crop state, but could raise lettuce, celery, tomatoes, potatoes, at the very time when they would bring the highest prices in the Northern markets; he made it a land of diversified farming; he saved the state and fed the whole country. Small wonder that his name is revered in Florida; that he has erected a monument which shall outlast and outshine even the greatest of the Pyramids.

Miami is a city well worth more than a passing notice. It was incorporated only twenty years ago, when it had just 162 inhabitants. Today it has nearly 30,000, and is one of the most rapidly growing cities in the state. The founders of the city were men of energy and foresight, and they builded well. The city is perfectly level and is situated on the Bay of Bescane, about three miles from the ocean. The avenues all run north and south, and are numbered from A up. The streets all cross at right angles, and are numbered from 1 up. So it is very easy to find any place desired, and the blocks are perfect squares. More cement work is done in Miami than in any place of its size in the world. The sidewalks are all of cement, and they extend far out into the country. The streets are the finest I have seen anywhere, and are very neat and clean. They can easily have perfect streets, for nature has given them vast quantities of limerock. All that is necessary is for them to put it upon the road and crush it with a steam roller. A white, hard road is formed that is as smooth as a floor. When you realize that there are no stones there, nor any hills, it is easy to see that good roads are not the problem they are in some cities. There are no street railroads as in other cities. Trackless street cars provide conveyance and go easily anywhere,—a method of locomotion possible only under such perfect road conditions. They run as easily as do the street cars in other cities and do not make as much noise.

The water supply of the city is good, there being a complete absence here of the sulphur water, so common on the western coast of Florida.

I have never seen fruit of all kinds as plentiful and cheap as it is in Miami. The finest grapefruit are sold for a cent apiece, and oranges are ten cents a dozen. All the summer vegetables are raised in profusion within the city limits and are very reasonable in price. Strawberries are very easily raised and can be obtained at all times. Meat is scarce and high, and of a very poor quality, but the finest of fish can be obtained at reasonable rates, and with the abundance and cheapness of fruits and vegetables, one can live there better than in any place in the North, and for less money.

Miami is a "bone-dry" city, and no liquor can be obtained anywhere. They feel strongly on the liquor question down there, and quote Miami's prosperity as evidence of the value of real prohibition. There is a sign in the center of the city which says "No poverty here," and indeed close observation leads me to believe that this is literally true. There is work for all, and everybody is busy and prosperous. The streets are well lighted at night, and there is an absolute freedom from the rowdyism so common in even the smaller towns of the North. The city has taken advanced ground on the school question, and its splendid school facilities and noted educators have been potent means in attracting desirable persons to make a home in the "Magic City."

There are more churches in Miami than in any other city I have ever seen, and a surprising portion of its people attend church. When the town was incorporated, to induce the railroad to come there, the authorities gave Mr. Flagler every other lot in the township. With his accustomed policy he presented a lot to every church organization formed. As a consequence, churches were planted all over the town, and they are supported in a manner that would shame the good people of New England.

One could speak for hours upon the charms and attractions of Miami. To my mind it is the finest city in the United States, without spot or blemish or any such thing; worthy of being called "The Queen of the South."

This seems to be a proper place to pause for a moment in the description of places and throw a little light or dust upon the two burning questions of the South,—prohibition and the negro, and it is surprising how they are interwoven.

I brought with me to the South all the ignorance, the egotism and the cynicism of the North on these questions, and I searched every dark corner in the South with patience and enthusiasm to see if perchance I could obtain a new vision and get the viewpoint of a section of the country I always thought radically wrong upon every political or economic issue.

What is the reason for the vast wave of prohibition that has swept over the whole South, and threatens to engulf the whole country? Nothing else at the outset but self-protection. The Southern people are no more wide awake or advanced on this issue than the people of the North, but they had to do it to protect themselves. The Southern white believes in drinking, and, left to himself, would have been the last to change. But the negro cannot use liquor even in moderation, and the whites know it. What started as simply a movement to keep liquor from the negroes, has developed into real prohibition for every one. An educated white man under the influence of liquor is a sad and disgusting sight. A negro under the same conditions is a tiger let loose, a volcano to be fled from by everyone. Never shall I forget the scathing denunciation and the severe fine inflicted by a judge in one of the Florida courts, on a white man for selling liquor illegally to a negro. My insatiable curiosity led me into a "colored barroom" in Jacksonville. It was a sight to chill the blood of a Northern man. It was like feeding poison to children, and would tempt even a law-abiding citizen to wish to wield the hatchet of a Carrie Nation. I have sometimes gone across the street to avoid meeting a drunken white man. I would flee from a drunken negro as from a pestilence. Prohibition in the South means safety to the wives and daughters of every man. More power to its progress!

The negro problem is a larger question, and every Southerner says it has been solved. How? By the supremacy of the white race. This is a white man's country, and the black man must be kept in his place. Where is that place? Outside the citizenship, in violation of the laws of the United States. No negro has rights in the South that a white man is bound to respect. They love *a* negro, allow them to attend their wives and children, to be real mothers to their choicest offspring. Indeed, from the appearance of many negroes, almost white, in the South, even grown men are not averse to taking them in their arms, alas too often. But this only proves the case,—the negro or any of his family has absolutely no protection from the white man. Look at this instance. In buying land in the South one must sign a cast-iron agreement binding himself and his heirs never to sell a foot of land to a negro. I doubt if a deed like this would bear a Supreme Court test, but this I know, that no man would dare to violate its provisions and attempt to live there afterwards.

The negroes are compelled to herd together like sheep, in the worst part of the town. Even the thrifty and educated are not allowed to get away from degrading environments. In every railroad station they are compelled to use a separate room,—often filthy, always poorly attended. In many places I found the toilet rooms of the negroes used by both sexes, and horribly unclean. You can guess what this means in the uplift of a degraded race.

Avoid it if you will, the South does not wish to have the negro educated, for with education must come a certain recognition of equality, and that he will not have. But, you say, what about the heroic Dr. Washington and the far-famed Tuskegee Institute? Does not the best element in the South support and approve of that? Yes, but only because the wisdom of its leader was devoted to instructing the pupils in trades and in domestic branches, where the Southern white needs them. Not one step does he admit this leads them towards equality. The South is dead wrong in its attitude towards negro education. In one prominent Florida city, settled almost entirely by Northern people, too, the school tax for white children is 20 cents on $100, and for colored children three mills. And yet more than half the children in the city are colored, and the negroes pay a large share of the taxes. They are not allowed in the white schools, but have inferior accommodations, often incompetent instructors, and no system. Northern teachers who go South to take charge of these schools are not recognized as equals by the Southern people.

St. Petersburg is one of the most progressive cities in Florida. Many of you know of their annual Washington's Day parade. It is one of the finest sights I ever witnessed. For months they are trained daily, and it is doubtful if any city in the United States gives such a fine exhibition; and yet not a negro child is allowed in the parade. Any of us could suggest how all of them might fit into this parade by themselves, to their own immense benefit, to the honor of the city, and as a characteristic illustration of a complex Southern problem. And yet one of the finest teachers in the public school there lost his position because he dared to propose that they be included.

Not only is the Southerner not willing to recognize the negro, but he is determined the Northern visitor shall not. He coerces the United States Government by forbidding him to write in the post-offices, except at a separated, ill-lighted desk. In Sanford I took a ride in a sight-seeing car, and out of sheer perversity sat in the negroes' seat and fell into an animated conversation with an intelligent darky. The white seats had all been filled before the conductor observed me. We were alone in the colored seats. After a time of scowling at me, he went to a man who was occupying a seat in front and talked to him. The car stopped and the man got out and sat with the driver. Presently the conductor tapped me on the shoulder and said, "I have found a seat for you in the white section; this is reserved for 'niggers.' " I smiled and went.

I was in Miami when a great revival was started. The organizer wanted every one in the city who would endeavor to lead a better life to enroll themselves, but he said, "We only want white converts; we have no use for the colored ones." Now I know that there were lots of Christian negroes in the city and that they would have been of immense help to the cause and their race, but I found that the whites of the South would go only to a white man's heaven and by a white man's road. But I learned something more. Near Rockledge is a convict camp, where some of the worst malefactors in Florida are confined. A great riot took place while I was there, and the cause was the placing of a negro convict in the same prison with the whites. Even a white murderer considers himself far above a negro chicken thief. And so I found that men who were bound straight to hell would go only to a white man's hell and by a white man's road. Alas for our boasted civilization! Small wonder that the negro is leaving the South in immense numbers and coming North to receive educational and political freedom.

But now that I have unsparingly lashed the South, with the undoubted sympathy of a Northern audience, I am going to antagonize every one of you. Were I living in the South I would not allow a single negro to vote if I could help it. I would not admit them to any lodge, society or organization to which I belonged. I would not give them any position of trust or responsibility. The United States never did a greater wrong than when they gave the negro the right of suffrage. The Southern people must fight this problem out for themselves. They are going about it all wrong, but sometime they will see the right. Few people, even in the North, still believe in a Force Bill, which once came so near being the law of the land. The negro cannot have the ballot again until the South is willing to give it to him, and even the whole power of the United States cannot force it upon the South till that time comes.

Now before I leave this subject let me lose the last bit of your sympathy. The North would treat the negro just as the South does if conditions were reversed. Right here in Worcester County within five years an educated, refined school teacher was forced out of a public school, where she was doing splendid work, because the other teachers accidentally found she had negro blood in her veins, and the white teachers refused to associate with her. Not a school committee in Massachusetts would dare to give a position to a negro, to teach, in spite of qualifications. The recent riots in Springfield, Ohio, where many innocent negroes were killed, is only what we cry out against in the South. The problem is coming tc us in the North soon. Have we the courage to face it and the intelligence to solve it, or shall we join with the South in spelling negro always with two "G's"?

One thing more I want to say about the South in general. It has other handicaps besides the negro in its race for supremacy with the North, and its greatest one is its contempt for the penny. Much has been said sneeringly about Yankee thrift, but it is the basis of our prosperity. The South despises a cent and ignores it at all times. The cheapest daily paper is five cents, and most of them are not worth half a cent. A quarter of a dollar is not twenty-five cents there. It is only "two bits." Such an insignificant thing no person would look at twice. If the South is going to compete with us successfully it has got to reform in its views of the value of a cent, and acquire a little of the despised Yankee thrift.

Much has been said about the Everglades, and the land scandal in connection with it assumed national notoriety. I was in that section when a farmer from Michigan came down there. He had bought a section of land there, sold his farm at home and brought his family with him. He found the whole section under water, and if it has not been drained, it is so yet. Moral: never buy land in Florida you haven't seen. The government has run a canal from the Miami River seventy miles through this dense swamp. The trip up there is one of the most interesting in Florida. The steamer leaves the city and runs for several miles up the Miami River, a winding and beautiful stream that takes one past fruitful orange groves, beautiful residences and palms of every description; past long stretches of the curious mangrove trees, and joins the canal, which has been built at so much cost. Soon the fertility near the city is succeeded by dense forests and impenetrable thickets, passable only by the Indians and the alligators. Along the banks are multitudes of beautiful blue herons, while over our heads soar, in their graceful flight, countless numbers of those scavengers of tropical countries, the turkey buzzards.

The land through which we pass is absolutely worthless until it has been drained, when it becomes a veritable treasure-house for the farmer. The soil is a revelation to a New Englander. It is like gunpowder, so soft and free from stones that it can be worked with the fingers. In this wilderness we saw wonderful fields of corn, potatoes and beans. Vast quantities of rice will be raised here in the near future. Coöperation and negroes will be necessary to the success of this undertaking. Individual farmers had better try some other part of the state. Here live the last remnants of the Seminole Indians. In their canoes they come down to Miami to trade, and their picturesque costumes give a startling color to the streets, as, rifle on shoulder, they gaze on the changes the white intruders have wrought.

In ascending the coast from Miami one will make no mistake if he forsake the railroad at Palm Beach, and continue the trip to St. Augustine by boat. It is inland all the way, and takes three days, the boat running only in the daytime. There are all-night stops at Fort Pierce, at Rockledge and at Daytona,—all interesting and distinctive places, where one can see so much of the real part of Florida. The Indian River up which we pass is probably as well known as any section of Florida, from the vast amounts of oranges which are sent North from there. It is not a river, simply an inland lake, that stretches nearly the whole length of Florida and connects at various points with the ocean. Before the railroad was built this was the only means of communication with this section, and the state has gone to a large expense to make the river navigable. Several canals had to be dug where the water was shallow, and it still requires much caution to keep in the channel. In some places we could touch the trees on the bank as we passed along. In others the river would be three miles wide, and it seemed as though we were on the ocean.

The prettiest sight on the whole river was the thousands of wild ducks we encountered. I never believed there were so many in existence. For two days we passed through almost continual flocks. They seemed to have but little fear of us and would wait until the steamer was within a few feet before flying. Their low graceful flight, the beautiful colors glistening in the sun, as they just skimmed the water, was worth going miles to see.

Thousands of beautiful islands were encountered, many of them as fine as any in the St. Lawrence River. A hail from one of these islands caused the captain to direct his course to the shore, and the occupant passed us a large box of oranges, which he thought a fair recompense for the sight of new faces and our old newspapers. We certainly had no reason to complain of the exchange. That we were in the heart of the very finest orange country in the world was soon evident. The sweet perfume of orange blossoms filled the air, and the river simply flowed oranges. The supply was so large that only the best were saved, and carloads were dumped into the river to get rid of them. Riding along the highway near Rockledge, time after time we would see a large pile of oranges, and a sign, "Free, help yourself!" But it only illustrates the fertility of this section. The problem of transportation is the great difficulty. The North wants the oranges and could consume any amount if the cost were not so high. The Florida East Coast Railroad controls the whole output, and they do not meet the orange-growers half way. Consequently the latter feel very bitter towards the railroad, and there is bound to be trouble there in the near future.

But the limits of my time are long past, and I have finished only the first chapter. A few general observations and I will close. The way to visit Florida, to get the best results, is to avoid hotels and hire furnished houses or apartments. I have been in every section of the state, and find this can be done everywhere. In Miami we hired a house for thirty-five dollars a month, while in Rockledge we secured a nicely furnished house of seven rooms for twenty-five dollars a month, and with it went a grove of fifty orange, tamarind and grapefruit trees in full bearing. How we enjoyed that grove, and how our friends in the North profited thereby! Living in hotels is too expensive and one eats too much meat, which ought to be avoided in Florida. Keeping house, one lives as do the residents there—simply, cheaply and healthfully. Gas stoves in the cities and kerosene stoves in the country places make the work easy and the problems light.

Any person with energy and a little money can do better in Florida than in any state in the Union. The state is attracting ambitious men from everywhere, who recognize its wonderful possibilities. No one, however, with safety can purchase land there he has not seen, nor can he hire land for some one else to develop and expect to see his money again.

On the other hand, anyone can go there and add five years to his life by so doing, and immeasurably to his happiness, for the old Spaniard was not mistaken; the "Fountain of Youth" really exists in Florida and I have drunk of its water. Would that every one of you might do the same!

Massachusetts Anti-Tuberculosis League.

THIRD ANNUAL MEETING, BOSTON, APRIL 10, 1917.

Introductory Remarks by the President.

By Vincent Y. Bowditch, M.D., Boston.

We come together today for our annual meeting under conditions which bring up weighty questions to each individual, to determine in which direction duty lies in the endeavor to serve our country best in the crisis now before her. May I give my personal conviction, after perplexing doubts which must naturally arise at such a time?

I feel very strongly that those of us who are working in special lines should not relax in our present efforts or change our form of work, unless special calls come, which make it imperative to take up what seems a larger duty. The conditions to which we are now giving our time and energy will not change so much for the better that they can be left to chance, and, in my opinion, if we continue the great fight against disease and stick to our posts, we serve our country as faithfully as those whose efforts have to be directed into other paths in consequence of sudden and great emergencies. I sincerely hope that in the coming months there will be no lessening in the number of those who have already done so much to make the work of our League so far of great value to our State.

Since our second annual meeting, in April, 1916, the attention of the public has been called to conditions on the other side of the Atlantic, especially in France, which make us realize that the older country is far behind our own in the handling of tuberculosis, especially since the appalling increase of the disease consequent upon war conditions there. The impossibility of coping with it adequately without sufficient aid from us is, moreover, painfully evident. It is gratifying to the sense of pride in our own work that France is turning to us now to learn the proper methods of treatment and prevention. The fact that through the Rockefeller Foundation, the man most eminently fitted for the position—Dr. Herman F. Biggs of New York—was sent abroad to study the tuberculosis question in France and to give his valuable aid in combating the disease, is proof of the respect which is felt for the work of America in these directions. These facts stand as an inspiration to us for continued and increasing endeavor in our special work.

The urgent calls for aid from Mrs. Edith Wharton in establishing proper hospitals and sanatoria for the afflicted soldiers in France, and the equally urgent appeals from Mrs. Post for the formation of dispensaries in Normandy and Brittany, should receive generous response from our own countrymen. Those of us who are working here on these special lines do not begrudge one iota of the large sums of money which are sent to sufferers abroad, and we cordially endorse these appeals. At the same time, we realize that the work necessary in our own country should not, must not, suffer in consequence of the need abroad. The terrible ravages of tuberculosis have not at present, perhaps, what may be called the sensational features of those on the other side of the Atlantic, but we all know and should let others know that we have still a tremendous problem before us here, and there must be no lessening—rather an increase—of the realization of this fact in our own great and wealthy country. Private institutions here are suffering for lack of funds in consequence of this great war and because of the natural and deep interest of our citizens in the welfare of a nation to which we owe so much for its aid to us in the past; but we have wealth enough to meet the needs of both.

With these statements as a preamble, let us turn to the specific work of our Association during the past year in contributing its share of support to various important measures. Since our last meeting, the act to provide for the construction by counties of tuberculosis hospitals for cities and towns having less than 50,000 inhabitants, has been passed and has become a law. The bill introduced by the State Department of Health has received active support in the discussions upon the subject by the representatives of the League,—chiefly by our efficient executive secretary, Mr. Stone, who has acted also as mouthpiece for our various committees.

Support has also been given by the League to two bills before the Legislature on the very important subject, "The Care of the Incorrigible Consumptive." One bill, making provision for the removal of offenders from surroundings in which they are a source of danger, is at present under favorable discussion; the other, which provides means to establish a suitable special hospital or place of detention for such delinquents, has not met with success this year—a fact which calls for further and persistent effort on the part of our members to impress the community with the importance of these measures. Massachusetts is still somewhat behind other states in this special matter. It should not remain so longer.

The reporting of cases of tuberculosis by physicians to the local and state boards of health is still far from what it should be. Although there has been undoubted improvement in this regard, statistics prove that there still exists great laxity in obedience to the law requiring physicians to report all cases. Nothing is more demoralizing to a community than disregard and contempt of laws which are made for the protection of the health of all. Constant watch is, therefore, necessary in such matters to see that laws are enforced. There has been a very marked improvement in recent years, since the anti-spitting laws were made. This is especially notable in our railroad and trolley cars, except in the smoking compartments, which are often in a disgraceful condition. Spitting upon the platforms and sidewalks, however, is still rife in most communities and demands a more rigid enforcement of law. A few arrests for misdemeanors have had in times past a wonderfully beneficial effect, which, however, gradually lessens as those in authority relax in their vigilance. Our tuberculosis societies and members of our League still have much missionary work to do in all these matters.

We have every reason for encouragement in our work. Dogged persistence is the only way to accomplish the desired end. We are having constant proofs of the decline in the death rate from tuberculosis, but a complacent optimism on the subject is not going to bring success. Only by united effort such as can be accomplished by the societies which form our League, can we hope to get control of the disease.

In this connection, I am glad to call special attention to the interesting experiment now being made by the Metropolitan Life Insurance Company of New York, which has established a "Community Health Station" in Framingham, Mass. That a Massachusetts town should have been selected for this is most gratifying, and there is promise of deeply interesting results which may be much more far-reaching throughout our country than we now dream. We are fortunate in having with us today Dr. Donald Armstrong, who has this experiment in charge. This work will offer an excellent opportunity for study to the members of our League so far as it touches the question of tuberculosis.

How much has been accomplished during the year in regard to the after-care of consumptive patients who have been discharged from sanatoria,—a subject of paramount importance,—we shall learn in a paper to be given today by Miss Billings.

It cannot be reiterated too often, that however successful we may be in establishing sanatoria, hospitals, and dispensaries or whatever for the cure and treatment of tuberculous patients, we must constantly keep in mind the still greater importance of preventive measures. We know that improper housing, poor accommodations in factories, and impure milk are prolific causes for the production of the disease. Persistent work in our ever-increasing attempts to remedy these evils will, we have every reason to hope, result in a still greater decrease in the mortality of this disease in the coming years.

TUBERCULOSIS IN DAIRY CATTLE.

By CURTIS M. HILLIARD, BOSTON,

Professor of Biology and Public Health, Simmons College.

TUBERCULOSIS in cattle has been more or less neglected by anti-tuberculosis societies because of its relatively low incidence in humans compared with the human type of infection. On the other hand, the fact that the occurrence of bovine tuberculosis in man is absolutely preventable, while the human variety is, at best, reducible only, would seem to make it imperative that the cattle disease should receive prompt and vigorous attention by all agencies and societies that aim at this scourge. The diseases that are generally transmitted from person to person, as contrasted with those that depend primarily upon some intermediate host or inanimate vehicle, are more difficult to control, for we can take any measures we choose in combating the microbes in the latter sources, while infected human beings must be treated with due regard to personal liberties, and they are willful agents, who must to some extent mingle with other persons. So cows, and food products derived from these animals, are amenable to any legislation we may choose to enact and enforce, or any specific treatment any owner may choose to practice. The human type of bacillus—almost ubiquitous in man—is kept within bounds chiefly in proportion to the degree of intelligent care which the patient uses in regard to the oral discharges, for he is only slightly responsible to legislation and enforced treatment.

Tuberculosis in cattle was recognized by Koch in 1882 in his early work on tuberculosis. He believed at that time that the microbic agent in the two hosts was identical, and this view was generally accepted until 1896, when Theobald Smith described certain striking differences, which have since that time been amplified. The professional world was startled in 1901 at the announcement by Koch that human and bovine tuberculosis were distinct entities, and that there was practically no danger to man from the existence of the disease in cattle. This stimulated a tremendous amount of work in many countries, which has led to the unanimous conclusion that bovine tuberculosis not only may be transmitted, but actually is frequently the cause of the disease in man.

The bovine bacillus resembles the human type in general, but tends to be a somewhat stouter, more solid staining organism. It is more virulent for animals ordinarily used in the laboratory, particularly the rabbit, and upon culture media containing glycerine the fermentation curve is characteristic.

In nature, the bacillus is found to live an exclusively parasitic existence. It is found to occur chiefly in the bodies of dairy cattle, but may also infect beef cattle, hogs raised in dairy districts, and rarely other animals, and finally is found in man. It is difficult to make any general statement regarding its prevalence in cattle. Less than 1% of beef cattle are tuberculous. In dairy herds, the disease seems to ravage the Eastern states more than the Western in this country. In New York, from 1910-1912, of 39,330 cattle examined by the tuberculin test, 7171, or 19%, reacted. In Vermont, during the last four years, out of approximately 29,000 tests, between 10 and 11% have reacted. The state commissioner on domestic animals in Connecticut states in the 1916 report "that 30% of our cattle are infected with this dreaded disease seems probable from those found in the herds, the owners of which have taken advantage of the tuberculin test." The Massachusetts commissioner states 12% as an approximate figure for this state. Of 35,000 cattle examined in England, about one-fourth proved tuberculous. Further citation of figures would be tedious. To be extremely conservative, let us say that 10% of all dairy cattle furnishing milk to our large cities for infants, children and adults alike, are infected with a disease which is transmissible to man.

To be transmissible, the bacillus must be able to pass from the infected animal to man, and we must next inquire as to the possibilities for this to occur.

The muscles of the animal are rarely diseased. The federal government and most of the states are very particular about passing meat for human food which comes from diseased animals. Meat is usually heated before consumption and, even if infected, would be rendered safe by this practice. Fortunately, it is now possible to conserve valuable food from animals not "passed" for first-class meat, by sterilizing it in cans and labelling it "second class" meat.

Milk and milk products are the chief go-betweens for the bacillus passing from cows to man. The germ rarely infects the milk glands, but when it does a most grave menace exists, for there may be almost as many tubercle bacilli in the milk as there are in sputum in active human cases, and it will dangerously infect the milk of a large number of cows, when mixed. The disease usually exists as a lung infection in cattle. The nose and throat discharges are infectious and serve as a fruitful source of infection amongst cattle themselves, but no special opportunity is afforded for the infection of milk directly from this source. Indirectly, however, the germs from this origin find their way into milk. They are "raised" by coughing, swallowed, and pass through the whole length of the alimentary tract in a virulent condition. In manure they will survive for some time, probably for weeks. Briscoe found artificially inoculated cow manure, exposed in a field for two months, still to retain virulent bovine bacilli.

Almost all milk contains some cow manure and so it might be anticipated that bovine tubercle bacilli will sometimes be found in milk. The following table is taken from Rosenau: "The Milk Question."

TUBERCLE BACILLI IN MARKET MILK.

City.	Investigator	Samples Examined	Per Cent Containing Tubercle Bacilli.
Chicago, 1910	Tonney	144	10.5
New York, 1909	Hess	107	16.0
Washington, 1906	Anderson	233	6.7
	Bu. An. Ind.	–	7.7
Rochester, 1907–1908	Goler	—	5.0 (about)

Probably between 7 and 8% of milk in our large cities contains tubercle bacilli. Ice cream, butter and cheese may also contain tubercle bacilli of animal origin. Cream, separated from milk, either naturally or by centrifugal force, carries bacteria with it, so that it contains several times as many organisms as does the skimmed milk. Examinations of these products, particularly butter, reveal the tubercle bacillus to be present altogether too commonly for comfort. It might be thought that the salt in butter and its storage in the cold would render the microbes harmless in a short time. In general, storage in the cold has a tendency to eliminate pathogenic bacteria, but in this case Mohler of the United States Bureau of Animal Industry has demonstrated the tubercle bacilli to remain virulent for 160 days in salted butter and for 261 days in cheese. Other investigators have not always proved such endurance, but most agree that the bacillus will survive for many weeks,—time ample for transmission to man. Furthermore, the bacillus enters through the mucosa of the intestine most conveniently with a fatty diet, so that these products are of great importance in relation to the problem.

The prevention of bovine tuberculosis in man is conveniently discussed under two separate headings: (1) The elimination of tuberculous cattle. (2) The pasteurization of milk.

Although tuberculosis is the cause of very serious economic loss to owners of dairy cattle, it is hard to make them appreciate this on account of the slow, subtle inroads of the disease. Contagious abortion, anthrax or foot-and-mouth disease stir the imagination and they will, for definite losses occur rapidly. Tuberculosis may be unsuspected in the dangerous animal, so far as physical conditions are concerned, and remains for years, perhaps, to infect other animals and to seed the milk. A careful routine physical examination by the competent veterinary will go a long way to keep a herd free from this disease, but a much more dependable diagnosis is known in the tuberculin test. The test is harmless, and of its kind is one of the most delicate tests known. In fact, it is so precise that this itself is almost a disadvantage, for it picks out animals with latent lesions, which might be milked with perfect safety for the time being, at least. It is better to err on the safe side, however, as such animals are potential active cases.

Time does not permit a consideration of the method and mechanism of the tuberculin test. Suffice it to say that the test has the confidence of most o fthe veterinary profession to detect tuberculosis in cattle, and to be absolutely harmless. That its use should not be promiscuous and should be performed only by those trained in the method and interpretation of results, goes without saying.

Given the information regarding the occurrence of tuberculosis, the badly diseased may be destroyed, while the slightly diseased may be isolated. The former, in most states, are paid for in part, at least, if the slaughtering and examination are supervised by a proper authority of the state. The reactors not seriously diseased are separated from the remainder of the herd and are used for breeding purposes, the calves being immediately removed when dropped. The milk may be heated and fed to calves and other stock. It is of fundamental importance to protect calves from infection and to avoid the introduction of infected cattle by purchases. What may be done by intelligent precaution is suggested by comparing the number of condemned animals tested upon application, and those tested for interstate shipment in the state of Vermont. The latter represent dealers who, in general, take precautions to keep their stock as free as possible from tuberculosis; while the former are the average, more indifferent owners.

Year	Terms of Test	No. Cattle Tested	Reactors	Per Cent.
1912–1914	On application of owners	16,985	1,601	9.39
	Under terms for shipment out of state	1,681	59	3.51
1914–1916	On application of owners	11,961	1,390	11.62
	Under terms for shipment out of state	9,702	366	3.77

This table shows what may be done, and should suggest the wisdom of routine testing for all farmers and breeders, from the economical standpoint alone.

The matter of introducing tuberculous-free stock only into herds which are being tested makes a heavy demand for guaranteed animals, and some official system of classification of tuberculous free herds by proper authorities should be of considerable assistance, encouragement, and remuneration to those farmers who are striving toward the goal. Officially recognized cattle could be sold and delivered in other states without the annoyance, delay and expense of performing the tuberculin test immediately prior to shipment. Such a plan, we understand, has operated successfully in the state of Illinois through the Board of Live Stock Sanitary Commissioners, the herds being divided into three classes according to the per cent. of reactors found at the last preceding tuberculin test.

Fig. 1.—A dangerously tuberculous cow. In appearance the subject of this picture is a well-kept family cow. She is dangerously tuberculous, because she expels tubercle bacilli from her body per rectum with her feces.

Fig. 2. A very old and visibly tuberculous cow.

It will be a long, long time before tuberculosis is stamped out of dairy cattle, and if we must depend upon this effort alone for protection of milk and milk products from transmitting the disease, the statement that I made regarding its absolute preventability would look doubtful indeed.

With the disease existent in cattle and with market milk commonly infected, we must attack the problem from another standpoint, and that is to destroy the microbe potentially in the milk. The production of clean milk with all that it involves as to structure of barns, cleaning of stables and animals, sterilizing of receptacles and the other manifold problems, is most important and should be encouraged and enforced. From the standpoint of the prevention of tuber-

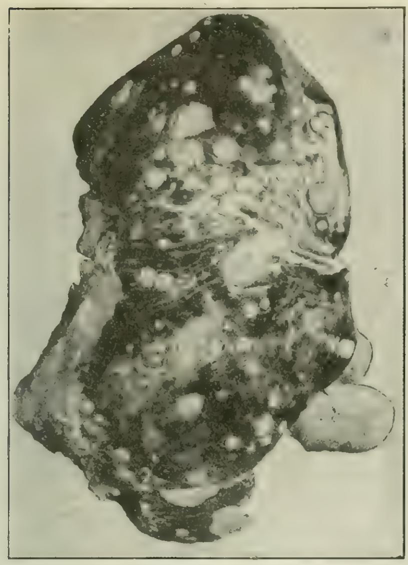

Fig. 3.—Liver of cow, showing many lesions on surface, and gall-bladder at lower right side of cut.

culosis, however, all these matters dwindle to relatively small dimensions when contrasted with pasteurization. It is difficult to understand the prejudice held against the practice of heating milk when it is the common procedure with almost all other animal food products. I am of the opinion that the occurrence of bovine tuberculosis in man is wholly preventable by the performance of this simple, common-sense practice under authoritative supervision. We have wrangled for years over the pros and cons of pasteurization, but all the conscientious objections raised in the early days have, one by one, been overthrown by scientific laboratory investigation and by practical results, until now argument and authoritative opinion are overwhelmingly in favor of heating milk to the relatively low temperature required to kill all pathogenic microbes. I know of no easier, cheaper, more certain way of avoiding any disease than by practising pasteurization of milk, and I believe it one of the most important functions of anti-tuberculosis leagues to do all in their power to bring about the day of compulsory pasteurization of all milk, except certified (and the day will come when most of that is heated also), which comes to our cities.

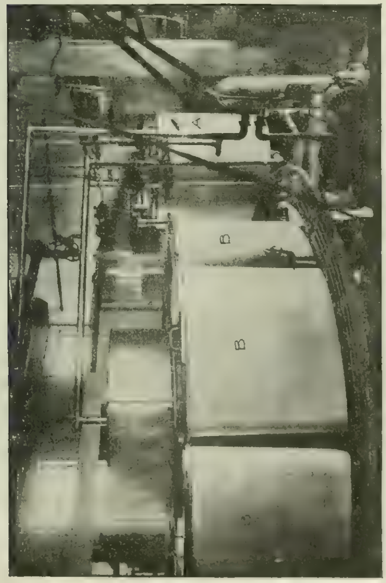

Fig. 4.—Pasteurization in bulk. Milk is heated to 145 degrees Fahrenheit in tank marked "A", then pumped into holding tanks marked "B" and held there at 145 degrees Fahrenheit for twenty-five minutes.

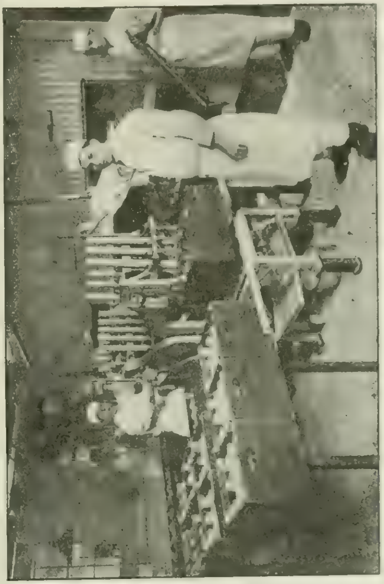

Fig. 5.—Bottling and capping room, after pasteurization.

The Danger to Children from Tuberculosis in Cattle.

By Richard M. Smith, M.D., Boston.

Mr. President: What I want to say is a very brief application of the facts which Professor Hilliard has given you. Bovine tuberculosis as it affects children represents, of course, only a small part of the disease in children, but it does represent a very substantial part, and a part which, as Professor Hilliard has said, can be entirely prevented. It seems to me that every case of bovine tuberculosis is a distinct disgrace to the community in which it occurs, because it is a type of disease which need never occur if we apply the remedy.

Before we take up the disease as it occurs in children, you must bear in mind that tuberculosis in general in children is very different from tuberculosis in adults. If we wait until we see the disease in the form in which it occurs in adults we shall miss the larger number of cases, and we shall miss all the cases that are in the stage in which they can be cured. In other words, when tuberculosis in children reaches the stage of tuberculosis of the lungs, it is an incurable disease.

Tuberculosis in children, for the most part, is a disease of the bones and glands, and it enters the body, in the vast majority of cases, by the digestive tract. I am talking of bovine tuberculosis. It enters probably through the tonsils and through the mucous membrane of the gastro-intestinal tract, in most instances not producing any lesion or any disturbance, any actual disease, at the point at which it enters but setting up trouble at once in the glands which drain the part of the body through which the bacteria enter. Bone tuberculosis probably represents a condition due to organisms which have escaped from the glands, circulated freely in the blood and become localized in the bones and joints.

Tuberculosis of bovine origin represents, in general, about 25% of all cases of tuberculosis in children under five years of age. In certain types of the disease it is very much more, but taking the cases by and large, about one child in every four with tuberculosis, under five years of age, acquires the disease from cattle. It is estimated that in New York City, for instance, between 6 and 10% of the children that die in the hospitals each year of tuberculosis, die of bovine tuberculosis, representing about 300 children a year. After the disease goes beyond the primary stage, that is, the stage in which it is localized in glands or bones, it shows practically no further tendency to localization, but takes the form of a meningitis or a general tuberculosis, so-called miliary tuberculosis.

Considering now the various types of disease: first, bone tuberculosis represents a type of the disease which for the most part remains localized in a single place. It is unusual to find tuberculosis elsewhere in the body when it is present in some particular bone; that is, tuberculosis of the spine, tuberculosis of the hip or knee, or what not, is not associated often with tuberculosis elsewhere in the body. This type of tuberculosis usually runs a very long course, but in the majority of instances not a fatal course. This does not mean that cases of bone tuberculosis are never fatal, but, in general, tuberculosis of the bones is not a fatal disease, but it is a disease of very long duration. It results, in a large proportion of cases, in some form of permanent deformity, either a stiff joint or a back which is not perfectly normal. The actual deformity is being reduced constantly by improved methods of treatment, but it, nevertheless, remains a fact that a considerable portion of the individuals who have tuberculosis in the bones or joints have a permanent deformity of greater or less degree. The percentage of cases of bone tuberculosis which are due to bovine infection, varies very markedly according to the age of the patient. In a series of 67 cases which were investigated, taking all of them together, 70% were of bovine origin, but under one year of age all were of bovine origin, and under four years of age at least 78%, so that beginning with all the cases at one year, going up to the children at twelve years of age, it ranges from 100 to 60%.

Considering now tuberculosis in the glands, the three common sites of infection are: first, in the neck; second, in the chest; and third, in the abdomen. Probably the commonest of all types of gland tuberculosis is tuberculosis of the glands of the neck, and this occurs almost entirely in children. Taking 72 consecutive cases of gland tuberculosis which were operated on at an English hospital, 90% were due to the bovine type of the organism; and taking the cases under five years of age, 38 in number, all but three were of bovine origin. So there again you see the younger the child the greater the likelihood of the bovine origin. In a recent investigation at the Children's Hospital, Boston, in all the tuberculous glands in the neck which have been removed within a considerable period of time, two-thirds of them have proved to be of bovine origin. In general, tuberculosis of the glands of the neck, again, is a disease which shows very little tendency to extend to other parts of the body. For the most part, the disease stays in the glands of the neck, and, again, is not usually fatal, but runs a long and protracted course, and in a considerable number of instances leaves a permanent scar of one sort or another. Either the glands break down and discharge, or they have to be operated upon. Here again, also, the present methods of treatment are greatly improving the end-results; that is, the number of children who get well without scars is increasing all the time.

When we come to glands in the chest, our statistics are much less definite. I have not any exact figures as to the proportion of cases of tuberculous glands in the chest that are of bovine origin. It is fair to assume, I think, that at least 25% in young children are of bovine origin. Tuberculosis in this location is extremely common in children, and it shows much less tendency to remain localized than either bone tuberculosis or tuberculosis in the glands of the neck. It does, however, stay in the glands in the chest in a considerable number of cases, and if it does remain localized there the children apparently get well with no permanent difficulty; that is, the cures are considerable in number, and are permanent. It is important to recognize that glands in the chest give entirely different signs from those of tuberculosis of the lungs. It is a distinct and different type of disease.

Tuberculous glands in the abdomen present a much more serious condition. It is quite possible for the disease to remain in the glands of the abdomen, but there is a much greater tendency for it to extend outside the glands and to involve the general abdominal cavity, and when such extension takes place the mortality is high. We are dealing, in abdominal glands, with a much more serious disease and a disease for which we can do very much less in the way of cure. Figures are not available as to the percentage of the bovine type of organism in this location.

It may be said of all types of tuberculosis, that the younger the child the more severe the disease and the less the chances that the child will get well. Under a year and a half the outlook is extremely serious, and from that point on it becomes increasingly favorable as the child grows older; but up until seven years of age it still remains a doubtful problem.

The treatment of tuberculosis in children is not different from the treatment of tuberculosis in adults, except that it is even more important that we recognize the disease in the early stages. It is, of course, important in all types of tuberculosis, that this be done, but in tuberculosis in children it is particularly important, because of the fact which I mentioned at the beginning, that if the disease once becomes extensive it is practically invariably fatal, and we must recognize it in its localized stage if we hope to cure it. The real hope of eliminating bovine tuberculosis rests in prevention, not in treatment: and, as has been said before, it ought to be possible entirely to eliminate it. It comes, exclusively, from milk and its products—from milk, cream, butter, ice-cream and cheese. I think we sometimes forget that milk products, other than milk itself, may carry tuberculosis. I have not the figures at hand for the percentage of market butter which shows active virulent tubercle bacilli, but it is quite large. That is, if you went into the open market and bought butter, with investigation, the chances are quite considerable that you would in that butter have virulent tubercle bacilli. And it does not make any difference how much you pay for the butter,—the price of the butter is no guarantee that it will be free from tuberculosis.

It seems to me that we have been slow to appreciate the importance of bovine tuberculosis in children, and have been very slow to apply the remedy. There are only two ways in which we can eliminate the disease: one is to have milk as it is produced free from tubercle bacilli, or else destroy the tubercle bacilli which are present in the milk. It is extremely difficult to have a tuberculosis-free dairy herd. Expense and the necessity for buying cows and the chance of infection all make it a good deal of a problem. We should accept the statement that a given herd is free from tuberculosis with a great deal of caution, unless we have definite evidence that the tuberculin test has been applied, and applied frequently and applied correctly. We see not infrequently in advertisements of milk that it is from a tuberculin-tested herd. We are, perhaps, willing to accept that at its face value; but I believe we ought to go a little deeper than that, because the tuberculin test, unless properly applied, gives us a false sense of security. Unless we have milk coming from a herd which is, in fact, free from tuberculosis, we must pasteurize milk. I believe all the arguments against the use of pasteurized milk are based largely on prejudice, and that there is no definite proof that the pasteurization of milk in any way interferes with its food value or has any unfavorable result in its use in the feeding of children. We must insist that all milk shall be pasteurized, unless we can be perfectly sure that it comes from a herd which is free from tuberculosis. A word of caution, however, is necessary in that connection. Unless milk is properly pasteurized, we are again setting up a false standard of security. We ought to exert all our influence to have some sort of inspection or supervision of pasteurizing plants if we are to adopt the general pasteurization of milk.

STARTING HEALTH HABITS IN CHILDHOOD, AS ILLUSTRATED BY A RECENT EXPERIMENT.

By Miss Louisa P. Loring, Prides Crossing, Mass.

Where children are concerned, it is difficult to draw the line between strict discipline and too lenient guidance in any branch of education, but to teach young boys and girls to form hygienic habits is an irksome task unless their interest is aroused. The Superintendent of the Bureau of Welfare of School Children, New York, Mr. Edward Brown, says: "It is trite, yet nevertheless sound, to say that all that seeks to improve the physical condition of children contributes to the general health of the community. If it is possible to render a dull pupil efficient through improving its physical condition, it would make it unnecessary to provide funds for the reëducation of such children. A child who is a good student is likely to continue in school and go on to a higher education much more readily than the child who, disappointed and in despair, leaves school owing to a bad scholarship record, the only cause of which may be some physical discomfiture, defect or disease. In the year 1913, 189,840 New York City children failed of promotion. The cost of reëducating this group for one term, based on $19.36 as the semi-annual per capita, equals $3,675,302.40. It is impossible to determine with any degree of accuracy how much of this is chargeable to physical defects—dental disease being the most common of them all. It is undoubtedly true that much of this sum probably could be saved by keeping the children in good physical trim.''

The public health and school nurses, in connection with the dispensary and dental clinic, are most important factors in this field. To illustrate, I give a practical experiment just made in the Beverly Public Health Dispensary.

Slips were printed and issued to the school children of the third, fourth, fifth, and sixth grades (that includes the ages between eight and twelve), covering one week in November, January and March, the idea being that continuity would interfere with the zest of novelty. These slips gave questions as to the daily carrying out of hygienic practices, beginning with the hour of rising, followed by the cleaning of teeth and nails, hair brushing, eating slowly at meals, taking ''all over'' baths, etc., finishing the list with inquiry as to sleeping with windows wide open, and the hour of retiring. The answers from about 1500 children were reported.

With regard to the hour of rising, 231 said they arose between four and five, 901 between five and six, 3014 between six and seven, and 10 between eleven and twelve.

How many times in the week did they wash ''thoroughly'' before breakfast? Four did not do so at all, 21 washed three times a week, 55 four times, 75 five times, 154 six times, with a triumphant climax of 1129 who washed seven times in the week.

The children have been cleaner since the slips have been used. Dr. Petruschsky (Danzig) says: ''Decayed teeth offer during childhood the chief passageway for the tuberculosis bacillus; thence arise the so-called scrofulous lymph ducts on the neck. Ninety per cent. of the Berlin, and 85% of the Danzig school children have been found affected by these swellings. The imminent danger of decaying teeth in early childhood is clearly shown from this.'' The results from cleaning the teeth, through the valuable dental clinic now established, have been very encouraging, the children whose teeth have been cleaned by the dentist being much more anxious to keep them white, the slips serving as a reminder. The slip mentioning an all-over bath every night sets a higher standard than we would expect to be carried out. In talking with the children in the schools, we find that they try to take at least two or three baths a week, thus changing the old idea of one ''Saturday-night scrub.''

Perhaps the most surprising statements were in answer to the hour of retiring. Starting with 13 who went to bed between five and six o'clock, through varying figures, the maximum being 5240 between eight and nine, we arrive at 156 children who went to bed between eleven and twelve, and 45 between twelve and one. There has been a decided decrease in tardiness owing to their reporting the hour of retiring. One teacher said that where she had averaged eight tardy marks a week, this had been brought down to one.

One great advantage is the increase of opening windows at night. A little Italian boy, Egidio, slept with his uncle. The first night or two the time was spent in opening and closing the window, the uncle insisting that it was too cold. Egidio won out, however, and the window was left open. Later the lad was allowed to sleep alone.

One child was left to be put to bed by the grandmother, who opened the window at first only three inches. The child said, ''Grandmother, how can you expect me to report to my teacher that I slept with my windows wide open if you don't open them?''

Another child was told to sleep alone and with windows open. He pulled the mattress out into the hall, leaving three brothers and a sister to lie on the spring!

In one home the father directed the children to post the slips in the bathroom and mark them there, thus bringing direct influence from the school to the home.

The slips so far have been used as an experiment, involving time and expense, and need further trial, but the evidence is certainly encouraging. Naturally there is a temptation to reply untruthfully, but, since no prizes are given, this is a minor difficulty, and the naïveté and candor of many of the answers bespeak the awakened interest of the children, and that is the factor for which we are working in order to confirm suggestion into habit.

Community Health and Tuberculosis Demonstration at Framingham.

By Donald B. Armstrong, M.D., Framingham, Mass.,
Executive Officer.

Mr. Chairman, Ladies and Gentlemen: I told Mr. Stone that I probably should not have time to prepare a formal paper for this occasion. Perhaps you are glad to know that I did not have time and I shall take up only a few minutes and try to tell you briefly about the Framingham health and tuberculosis demonstration in an informal way.

As you probably know, the health demonstration in Framingham is under the auspices of the National Tuberculosis Association, and is financed by the Metropolitan Life Insurance Company, or by a gift from that company to the National Association for the special purpose of carrying out in a chosen town a demonstration aiming at the discovery and control of all cases of tuberculosis in all stages, and incidentally at the carrying out of a complete health program for the community. The objects of our health demonstration are, first, then, the discovery, treatment, care and prevention of tuberculosis. It is believed, however, by the committee which has this work in charge, that it is impossible to get at the tuberculosis problem unless the work is given a fairly wide range. It is not a disease, as you know, which affects a definite age group. It is an infant problem and a school problem. It is a serious industrial disease factor. It is a problem which affects all age groups, and for that reason our program in its construction and in the way in which we are attempting to work it out at present is a general health program. It is also, as far as the discovery and treatment of tuberculosis and the general health of the community are concerned, a problem of controlling the various agencies in the community that are, at least, potential factors for disease detection. It is a problem of shaping those agencies and those influences to the end of disease detection, disease elimination and health correction. From that point of view, a complete community health program is, in reality, an experiment in social organization, so that the view that we have of the job in Framingham is not only a tuberculosis job and not only a health job, but in reality and fundamentally a problem in community organization.

We believe that there are certain fundamental essentials in carrying out such a community program. First, it is essential, in our estimation, that the work be done on a coöperative basis, that it be done on a persuasive basis, a democratic basis. As a matter of fact, that is not only wise but it is absolutely necessary, in view of the fact that we have no machinery and no authority to do anything else. It is believed, though, that if we can, in this town and in this country, work out an experiment which will be successful in detecting preventable disease and in encouraging health,—an experiment actually worked out on a democratic basis, successful because of the coöperation which it receives from the individual citizens and from the agencies and organizations, official and unofficial, in Framingham, we shall have made a demonstration that will be of special importance at the present time in this country. It is from that point of view an experiment in democracy.

Now, another essential is that the work be on a permanent basis. We are attempting to do things with as little artificiality as possible. By that I mean especially that if we carry out a health measure, and it is proved to be a desirable thing from a routine point of view, then what we have done, in so far as possible, should be placed on a permanent basis by the local agencies, so that when we are through with our demonstration there will be left in the community an adequate machinery for carrying on the health and disease preventive work of the community. I refer, for instance, to such a matter as medical school inspection, and also, perhaps, factory medical supervision, and things of that kind, which are of permanent value to the community.

Another essential of the work is to have always the advice in every field of the best expert help we can get. Now this applies, not only to medical activities such as the consultation service that we have established for the local physicians in cases of doubtful diagnosis for tuberculosis as well as perhaps for other things (at least other things that may complicate the diagnosis of tuberculosis), but it also applies to the educational work which we want to carry out, to the problems of school hygiene, and to the problems of factory hygiene. We have, for instance, just completed a special study of school hygiene with the coöperation of the public health service, which service assigned to us its school hygienist for the special job of determining what was the best, most adequate and most economical method of meeting the needs of the school children in Framingham from the point of view of health. The same thing probably will be done on the factory side. I am glad to say that this latter study, or rather the former one that I mentioned, the school problem, resulted in adequate action on the part of the community. At its last town meeting the town, having previously spent about $1200 a year for health work, increased this to $4000, making possible a full-time medical school inspector, probably two school nurses and some clinic facilities. This was, in part at least, a result of our investigation, and a result of the work and the demonstration made by the public health service of what was needed. That illustrates several principles that we are working out: outside expert coöperation, and the encouragement of the community to meet its own logical health obligations.

To come more specifically and briefly to the program, as we are trying to work it out, it includes several major phases. In the first place, there is the acquainting of the community with the things that we are trying to do. We have published a pamphlet and several leaflets, which have been widely distributed. We have had excellent coöperation from the local press in the dissemination of facts about the work, and we have in every way attempted to get the people of Framingham interested, through the appointment of local committees of various kinds, and through the dissemination of facts about the work which we are attempting to get started. This educational work, however, is just beginning. We are attempting to carry it out along the lines of a well-established program, which would cover the three or four or five years of the demonstration; a program which would emphasize certain things at certain times, taking advantage of seasonal opportunities to place emphasis upon certain special health or disease preventive principles; a program which would take advantage especially of routine regular educational opportunities, such as the regular classes in the schools, in the high schools, in the Sunday schools, and elsewhere. That program, as I say, is a three- to five-year proposition, and it is being worked out on that basis.

Obviously, the first thing we have had to do is to make a diagnosis of conditions in Fram ingham. We are just now in the midst of our community diagnosis. This is a problem of diagnosing a community from the point of view of tuberculosis as well as of disease incidence and unhygienic conditions in general. It falls along two main lines. In the first place, we have the question of the environment, the surroundings in which children go to school or infants live or people work, or the homes in which they live: in other words, the environmental problem. We are completing a thorough study of sanitary and hygienic conditions in Framingham, covering all parts of the community, rural as well as urban, considering also the school problems, the industrial problems, etc., so that we shall know within a short time what are the special disease hazards in the community, what are the things that are apt to cause disease or to encourage the development of disease, particularly tuberculosis. In this work we have the coöperation of such agencies as the Russell Sage Foundation of New York, the United States Public Health Service, the State Department of Health, the Board of Labor and Industries, and other official and private agencies. That is one side of the problem, the easiest side from the point of view of making a diagnosis, because the other phase concerns the individual himself.

How much sickness is there actually in a town of 16,000 people? How much sickness is there from the point of view of special age groups, of school children, factory workers, etc.? How much sickness of special kinds is there, such as tuberculosis, for instance? I don't mean only admitted, obvious illness; I mean incipient disease, unrecognized disease. It is essential that we know these facts about Framingham as near the beginning of the demonstration as is possible, because we want to be able to compare conditions at the end of the demonstration with conditions now, and we want to be able to know along what lines it is most urgent for us to expend the amount of money we have to expend for disease prevention. So, we are attempting just at this time, with the help of the insurance agents and of the nurses from the local hospital and some nurses loaned to us by Boston agencies, to make a thorough canvass of existing illness in Framingham. That, of course, will give us admitted illness in so far as we are successful in soliciting reliable information.

At the same time, we are attempting to find about 500 or 600 families who will be willing to have a thorough medical examination by physicians whom we shall bring to the town,—physicians who will come from the state institutions, the public health service and other agencies. In this way we shall get a thorough medical canvass of a reasonably large part of the community. If our selection of families is various and typical of the community, of the different conditions, different nationalities and age groups in the community, we shall be able to tell about how much sickness of various kinds there actually is in Framingham. Consequently, the study of the individual disease incidence is a complementary part of making a diagnosis, supplementing the study of environmental conditions.

You may wonder—and I am sorry I have not time to go into more detail—about what we are going to do after we know what the conditions are in Framingham. That is the other side of the story. In the first place, it is obvious, I think, that we are devising machinery to detect disease, and if it works we are going to find disease through several methods, particularly tuberculosis, but other preventable diseases as well. We are going to find sickness through the sickness canvass; through the thorough medical examinations; we are going to find it through the full-time medical inspector for the schools, through the factory medical supervision, which we have reasonable assurance of being able to see provided by private industrial agencies in Framingham. We are also, of course, working out a plan with the public health service by which the physicians of Framingham will be asked to report morbidity of all kinds. We are asking them to take advantage of a consultation service for the determination of a diagnosis in difficult cases, especially pulmonary cases. That ought to help us, perhaps, in detecting certain incipient cases; in fact, it has already been of benefit in several instances of that kind. We eventually, of course, want to demonstrate to the people of Framingham the value of thorough medical supervision, of thorough medical examinations. We want to demonstrate also to the *physicians* the value of thorough medical examinations, as well as the method and the technic of making thorough medical examinations. To accomplish the latter object, we have organized a local medical club, and under the auspices of that club there will be brought to Framingham from time to time the best lecturers that we can find anywhere in the country, who will hold lectures, demonstrations and clinics on thorough methods of examination, on the detection of incipient disease, on other matters of medical and disease-preventive interest. If we are successful in the medical examination work which we are undertaking at the present time, we shall have another argument, not only with the physicians, but also with the people, for the value of thorough medical control.

We can then say that we have examined a certain percentage of the people of Framingham. We can say that in that number a certain percentage of people are sick, a certain percentage are sick with preventable disease, a certain percentage are sick with incipient disease. If that is true for this typically selected sampling of the community, it would also probably be true for the rest of the community. It gives us a basis for advocating medical control and thorough medical examinations.

In this work we need, of course, the coöperation and sympathy, especially of local people.

and of outside agencies primarily interested in disease prevention, particularly tuberculosis. The committee in charge of the work believes that with such coöperation we shall be able, in Framingham, to demonstrate that a firm physical and health foundation on a community basis can be laid for future social and economic growth.

COUNTY TUBERCULOSIS HOSPITALS: REPORT OF PROGRESS.

By Eugene R. Kelley, M.D., Boston,

Director of the Division of Communicable Diseases, Massachusetts State Department of Health.

This part of our program is rightly entitled "A Report of Progress," for progress in this important field of anti-tuberculosis activity has been most satisfactory in this State in the past year. The law as enacted (Chap. 286, Laws of 1916) provided that, with the exception of five counties, the county commissioners must furnish tuberculosis hospital accommodations for all the cities and towns in each county having less than 50,000 population (1910 census) and not already possessing tuberculosis hospitals. All cities over 50,000 population are still required to provide such hospital accommodations, independently of the counties, by the provisions of the original hospital law (Sec. 35, Chap. 75, with subsequent amendments). Cities having less than 50,000 population, but already maintaining, or having maintained for their benefit, tuberculosis hospitals at the time of the passage of the county hospital law and continuing to maintain them in the future, are also exempt from the operation of the county law. The list of such cities is quite a considerable one. They are: Pittsfield, Chicopee, Fitchburg, Haverhill, Salem, Clinton, Brookline, Waltham, and formerly, also, Everett. Since the county law went into effect the city of Newburyport has also been exempted from its operation by a special act of the present General Court because of the donation to the city of a tuberculosis ward in connection with the Anna Jacques Hospital.

Of the five exempt counties, Barnstable and Hampshire already possessed tuberculosis hospitals, erected under the authority of special statutes. Dukes and Nantucket counties have such small populations that it would be absurd to require them to maintain tuberculosis hospitals. Suffolk county consists of the city of Boston and the cities of Chelsea, Revere, and the town of Winthrop. A peculiar feature in this county is the absence of most of the machinery of county government. There are no county commissioners and most of the functions of the county government have been vested in the city council of Boston. Boston being, of course, already provided with tuberculosis hospitals, it was found necessary by special section of the county tuberculosis hospital law to provide that the city and town officials of Chelsea, Revere and Winthrop should furnish tuberculosis hospital facilities in the same manner that commissioners do in other counties.

The law provided that county commissioners might comply with its provisions by either of two methods: (*a*) by providing that the necessary bed space be furnished by contract with existing institutions before January 1, 1917, for patients from designated cities and towns within the county, or (*b*) by building a new hospital or hospitals for the benefit of the cities and towns coming under the terms of the act before September 1, 1918. In either case the number of beds available must be at least one bed for every two deaths annually, in the cities and towns affected. The number of "deaths annually" is determined, however, for the purposes of the law, by taking the average number of deaths annually from consumption in the cities and towns in question for each succeeding five-year period, beginning with 1911. Another provision of the law, as originally enacted, stipulated that no new hospital should be constructed with a capacity of less than fifty beds.

Certain unforeseen defects and omissions in the original law resulted in several amendments being necessary during the present session of the Legislature, but, on the whole, the law has worked out smoothly. Less advantage has been taken of the contract possibilities of the law than we anticipated when passed. Franklin and Hampden counties have complied with the law by making a contract arrangement with the Hampshire County Tuberculosis Sanatorium. The commissioners of Worcester county still hope to perfect an arrangement by contract with existing institutions in various sections of that county, and for that purpose have obtained an extension of the time of complying with the law by contract from January 1, 1917, to April 1, 1918.

In Berkshire county it was found impracticable for the county commissioners to obtain a mutually satisfactory contract arrangement with the existing tuberculosis institution, which is owned and controlled by the Pittsfield Anti-Tuberculosis Society, and by virtue of which the city of Pittsfield obtains exemption from the county hospital law. A study of the local tuberculosis situation for the remainder of this county showed conclusively that in all probability not more than one-half of the legal minimum of beds necessary under new construction, *i.e.*, fifty, would be necessary to comply with either the statutory ratio of beds to deaths, or with all probable prospective demands for bed space for many years to come. The commissioners, therefore, sought an amendment to the law, permitting them to erect a new institution with as many less than fifty beds as the State Department of Health would approve. This bill has already been enacted, and the Berkshire County commissioners assure us that they will speedily select a site and commence building operations.

The county commissioners of Essex, Middlesex, Norfolk and Plymouth counties have already secured their sites, and are planning to begin construction within a few weeks. In all these counties various contract schemes were carefully considered. In some instances, with the expectation of supplying all the beds required by the law by means of contract arrangement, in others simply with an idea of providing for the hospital needs of certain sections of the county by means of contract, and for the rest of the county by new construction. In Middlesex county the minimum number of beds required, 210, was so large as to cause the commissioners seriously to consider the advisability of building two institutions in different sections of the county. But in all instances it was finally decided that the provisions of the law could be best carried out and the largest proportion of the population provided with reasonably nearby hospital accommodations by the construction of a single institution. Architects have already been selected or are now negotiating with the commissioners of all these counties. There has been and still is a certain amount of objection to nearly all the sites chosen, based principally upon a totally erroneous conception of the effects of a tuberculosis hospital upon its surroundings.

The county commissioners and the district health officers of the State Health Department have all devoted much time to the study and inspection of available sites and have conferred with each other repeatedly over the site problems during the past six months. As a result, we believe the sites selected are, in each instance, the best possible site in the county. Some astonishingly gratifying results as to accessibility have been obtained by this careful study. In Norfolk county, 47% of the population to be served is within a three mile radius, and 75% is within a ten mile radius. In Plymouth county the site is immediately adjacent to the principal trolley line across the county, adjacent to one of the principal state highways, and within a quarter of a mile of the railroad station and, in addition, 36% of the population to be served is within a five mile, 84% within a ten mile, and 95% within a fifteen mile radius. In Essex county the site is not only charmingly located from the standpoint of view, but is within a fifteen cent, one hour trolley service directly to the institution from every point in the county. While the topography and arrangement of the highway, steam and electric railway systems of Middlesex county make it quite impossible to duplicate Essex county accessibility, yet the site secured for Middlesex is within a very brief trolley ride for over 50% of the population served, has three steam railroad lines nearby, and is almost equally accessible by a reasonably short trolley ride from the farthest western and northern points of the county. In addition, all four of these sites are well sheltered from the north winds, possess a sunny southern exposure, splendid views, and in three instances handsome pine groves, while the fourth site is already most artistically developed in the matter of lawns and many other improvements, including several substantial buildings well adapted to the institution's needs.

It has remained, however, for Bristol county to develop the most unique and, from the standpoint of future possibilities in socialized medicine, the most interesting extension of our county tuberculosis hospital law. Accepting with a most cordial spirit the provisions of the law, so far as they originally went, the town authorities of this county, almost in a body, appeared before the committees of this General Court and expressed a vigorous dissatisfaction with the law as applied to Bristol county conditions on the ground that it did not go far enough. Therefore, they sought and practically have already obtained, although the measure is not yet enacted, an amendment to the law, authorizing the commissioners of Bristol county to provide under the same administration, in addition to the tuberculosis wards, wards for contagious cases generally. So far, Bristol county authorities simply followed the precedent set by the provisions of the Barnstable County Infirmary law. But in advance of all Massachusetts precedents, by this amendment Bristol has also obtained authority to provide for the construction of additional wards in their county institution for those all too common cases seriously ill with advanced chronic diseases. I refer to cases of that type of chronic illness that are too ill to be properly cared for at home or in town almshouses, and yet are refused admission everywhere to general hospitals because they are not cases of acute illness.

In closing, I wish to express my personal appreciation of, and to go publicly on record as testifying to the admirable spirit of public service and humanitarian interest exhibited by our various boards of county commissioners in carrying out the provisions of this law, which has placed upon them, unsought and undesired, such arduous and exacting additional obligations.

What Becomes of the Discharged Consumptives?

By Miss Bernice M. Billings, Boston.

Public Health Nurse; Trustee, Massachusetts Hospitals for Consumptives.

From 1906 to 1912 the Associated Committees of the Massachusetts Medical Society, the various local anti-tuberculosis societies and a few boards of health were the only agencies in the State with whom the State Tuberculosis Commission coöperated in regard to after-care work. In 1912 a large number of these agencies were inactive, with the result that there was little or no definite knowledge as to what became of the great majority of the discharged sanatoria patients.

The after-care work was started July 27, 1912, the experiment being financed by the Boston Association for the Relief and Control of Tuberculosis until February, 1913, when this work was taken over by the State. After a survey of the State, it was found that less than a dozen agencies were doing serious work in the following up of discharged patients or in the visiting of other consumptives in the community. In many instances private physicians were caring for patients, but the greater number of these who had called in a physician were already in the advanced stages before they felt the need of medical advice. When the work started the outlook was discouraging. Many of the patients were very ill and dying, while the members of the families were not alive to their responsibilities, both in the care of the patient and in the protection of others. There were comparatively few agencies ready to do follow-up work, while in addition it was hot weather, with all the attendant discomforts this brings to the sick poor. Very few of those who were thus exposed to the disease had been examined. In fact, I found that the one thing that I could say, which was sure to antagonize the majority of the adult members of the family was, "Have your children been examined?" This nearly always brought a response, "No! My children are perfectly healthy."

PLAN AFTER-CARE WORK.

In the beginning, the after-care work was not done on definite lines, as it is at present. It was at first more in the nature of a survey to find out the condition of the patients, the number who were under proper medical supervision, the agencies in the city or town in order, if possible, to bring about a close relation between patient, physician, and local resources. As time went on, through the efforts of the State Department of Health, the local boards of health, and private physicians, the agencies already in the various towns and cities began to assume some responsibility towards our ex-sanatorium patients.

After two years I was able to count 92 agencies who coöperated with our Board, while at present I am glad to say that there are 128 boards of health, associations, etc., covering 132 towns, on which I can rely for help.

DISPENSARIES.

In 1915 and 1916, with the opening of 56 dispensaries, I was relieved of home visiting in the larger localities, and was able to devote more of my time to the rural communities. At present my work is systematically arranged according to counties. This brings me into each county every four to six months.

AFTER-CARE LETTERS.

As time went on, a system of after-care letters was started. The object of these letters is to notify the agencies in a community as soon as the patient is discharged, and to give some detailed information regarding the discharged patient. These letters give the date of admission and discharge, the condition on admission and at discharge of each patient, along with suggestions as to further treatment.

HOSPITALS.

With the increasing number of local hospitals many very sick patients are transferred to these hospitals from the State sanatoria, so that they may be near their own homes, where they can be visited by relatives and friends. In addition to this, local authorities are finding it much more profitable to board a patient at some hospital, pending his admission to the state sanatorium, especially where our own waiting list is long. In this way such a patient, without adequate facilities for treatment at home, may be making steady progress, instead of entering the sanatorium in a hopeless condition. In the cities and towns with local dispensaries, the nurses in charge are much more alert in visiting and keeping in touch with discharged patients than before.

DISPENSARY NURSES.

When the follow-up work was first started it was not uncommon to have a nurse tell me that she had not visited the sanatorium patients, as they had already received training while at the sanatorium, and she felt that her time must be spent on those who were more in need of care. I am led to believe that, since more and more of the advanced cases go to local tuberculosis hospitals, the nurses have more time for follow-up work where it will do most good. The dispensary nurses have had many children who had been exposed to tuberculosis examined both by private physicians and at the local dispensaries. In cities where active work is being done by dispensaries, there has been a very marked increase in the number of patients who are sent to the sanatoria. In one city of 22,000 population, previous to the opening of the dispensary, five patients were admitted to the sanatoria from 1912 to 1915; since the dispensary opened, fourteen patients have been admitted to the sanatoria from 1915 to 1917.

The progress we are making in the cities and larger towns is also seen in the rural communities. In the small town I find patient and family more interested in the intelligent care of patients and the protection of the family, and they are more willing to consider sending their children to private physicians for examination.

VISITING NURSE.

The visiting nurse deserves her share of praise for some excellent work in the small communities. There are many small towns in the State where I have perfect confidence that a discharged sanatorium patient will be placed under supervision almost immediately after returning to his home. In the beginning of the work it was said that many of the patients would evade a visitor, that patients objected to being visited, feeling that their personal liberty was in danger, etc. This has not been my experience. In 1912 there were a few patients who thought that a State visitor meant simply a gatherer of statistics, but when the nature of the work was understood I was well received. Today, in the majority of homes, I am expected, as they hear at the sanatorium that a visitor will come. This past winter I have been especially well received. Hot drinks and food were offered me, and instead of asking, "Why is a visitor sent to me?," I have been asked, "Why did you not come before? we have been expecting you."

UNKNOWN PATIENTS.

One reason why we find it hard to locate a patient is not because the patient wishes to evade a visitor, but because a different way of living has been taught at the sanatorium, and the patient is not satisfied with his old home. This often means a change to a different part of the town, and sometimes a change of town, or from a crowded part of a city to a rural community. Where information is given to me by a city nurse that a patient is in a small town many miles away, I write the board of health or nurse in that village, giving what information I possess. I then visit this patient as soon as I am in that section of the State. My work means many long walks and many miles of driving over good and bad roads, in one instance thirty-five miles in one day, in all sorts of weather—to say nothing of long train and trolley trips. It has been my policy that if our patients and their families could go over bad roads there was no reason why I could not at least attempt it, and although a few times the auto was stuck, except for making one miss a train, there was no harm done and the patient was seen.

COÖPERATION OF LOCAL AND STATE AUTHORITIES.

In my work I have been greatly helped by the district health officers, boards of health, private physicians and nursing agencies, and it is to this close coöperation that we must look for our future success in the work.

The following figures, representing a study of 1056 patients discharged from the State sanatoria between May 1, 1912, and April 30, 1914, will prove to you that not all discharged sanatoria patients die or are unknown.

CONDITION ON ADMISSION.

Incipient, 181 — 17%.
Moderately advanced, 379 — 36%.
Advanced, 489 — 46%.
Not examined, 7 — 6%.

CONDITION ON FIRST VISIT.

Good condition, 303 = 29%.
Living, 531 = 50%.
Dead, 120 = 11%.
Left State and unknown, 102 = 10%.

PRESENT CONDITION.

Good and working, 312 = 30%.
Living, 121 = 11%.
Dead, 485 = 46%.
Left State and unknown, 138 = 13%.

EARNINGS OF PATIENTS EACH WEEK.

137 men earn $1,817.
150 women earn $1,179.
Total, $2,996.

As so many of these patients (40%) were in the advanced stage of the disease, and as there was so little adequate supervision during the first two years, it seems to me that we have good reason to feel encouraged, especially as patients are remaining longer at the sanatoria, and as there are so many more agencies doing really good work in supervising patients immediately after they leave the institution.

CONVEYANCE FOR NURSES.

There is still great need for improvement in cities, towns and villages. Great stress has always been laid on the fact that nurses doing follow-up work should be properly qualified to fill the position, both in personality and training. In the cities one of the very great drawbacks to effective work is the fact that the nurse may be ever so capable and conscientious, but if her work is spread too thin it is next to impossible to get good results. We have in one of our cities a nurse with a visiting list of over 200 patients with their families, 100 of these being open, active cases. This nurse is dependent upon trolley for transportation. It would be but good business to provide a nurse with a Ford under such circumstances as this. No one in these days would think of having the heads of other city departments use the trolley, and it would seem to me the same idea applied to a nurse. Can we wonder that after a few years of such hard work, a nurse is unable to keep up this strain and resigns! After long experience, she is much more valuable to the community than ever before. The members of the Board which employs her should realize this, and that as the work grows, more help is needed.

WORK OF VISITING NURSE.

In some towns of 15,000 the one visiting nurse is expected to do bedside nursing, follow-up work for tuberculosis patients, and any amount of relief work. It is impossible to do so much and do it well. In one town of 15,000 there should be at least three nurses, if the school work is to be added to the list; with less than this the work will never grow and develop as it should. The smaller communities need a visiting nurse.

It seems to me the members of this Anti-Tuberculosis League can be of very great assistance in moulding public opinion and making it possible to develop this after-care work still further.

Annual Report of the Massachusetts Anti-Tuberculosis League—1917.

By Seymour H. Stone, Boston,
Secretary.

LEGISLATION.

This year the League has considered 36 legislative bills, as compared with 41 of the previous year.

Most of last year's bills were of minor importance, with the exception of the bill, which became a law, requiring counties to construct tuberculosis hospitals for patients in communities of less than 50,000 inhabitants, and bills, which were not passed, that would have made it possible to isolate the wilfully careless and incorrigible consumptive.

The bills pertaining to tuberculosis now before this year's Legislature, with the exception of one on wilfully careless and incorrigible consumptives, which bids fair to go through the Legislature, are also of minor importance, and as a rule do not affect the State policy in the care of the tuberculous.

It is necessary, however, for someone to keep in touch each year with the measures presented to the Legislature, not only to watch for those that might interfere with the campaign against the disease, but also to be ready to secure support for those that will be helpful, as well as to keep the anti-tuberculosis associations and other interested agencies informed.

PUBLICITY.

Literature.—During the year 12,000 pieces of literature have been distributed. Of this number, 4450 were press bulletins of the National Association, sent to over 200 newspapers in the State, the balance being educational circulars and pamphlets of several kinds, circulars in regard to legislation, programs of meetings and annual reports.

Lectures.—A total of 14 talks has been given, 10 by the Secretary and 4 under the auspices of the Committee on Rural Tuberculosis. These talks have been on Tuberculosis, Open-Air Schools, and Tuberculosis in Cattle, and many have been illustrated.

The attendance has totalled about 1400 persons.

Slides and Films.—In addition to the illustrated talks, our slides have been loaned to other speakers, who have reached a total of about 1300 people.

Two films belonging to the Boston Association, "The Awakening of John Bond" and "The Great Truth," have been used on a number of occasions in League territory.

Exhibits.—The League has taken part in 13 "Health Weeks" in the State by loaning its small tuberculosis exhibit. Mention should be made here of the coöperation on many of these occasions of the Health in Industry Committee of the Boston Association, in giving the use of its interesting exhibit pertaining to the health of employees in manufacturing and mercantile establishments; also the loan on several occasions of the Boston Association's "Open-Air School" exhibit.

It is estimated that these exhibits have been seen by a total of 62,500 people

RURAL TUBERCULOSIS.

In May, 1916, when it seemed probable that the legislative bill requiring counties to provide tuberculosis hospitals for communities under 50,000 inhabitants would become a law, the League appointed a committee on rural tuberculosis, for the purpose of arousing an interest in the problem in rural communities. Later an officer of the State grange was added to the committee, and the coöperation of the agricultural college and grange secured.

The committee first made a study of the death rate per 100,000 population from pulmonary tuberculosis in the State for the ten years, 1905 to 1914. It was found that the average death rate in the entire State for this period was 134.83. For cities of 50,000 inhabitants and over, the rate was 150.89. For the rural communities (population 2500 or less), including the three towns of Lakeville, North Reading and Rutland, where State sanatoria are located, the rate was 150.26. For the rural communities, excluding Lakeville, North Reading and Rutland, the rate was 99.88.

The committee finds that deaths occurring in State institutions are charged up to the town in which the institution is located, instead of to the city or town from which the patient came, and it is, therefore, impossible to arrive at an accurate death rate in either cities or towns. This difficulty should be remedied. An article and chart on these facts were prepared and printed in the Monthly Bulletin of the State Department of Health.

The committee has also prepared a lecture on "Tuberculosis in Cattle as an Economic and Public Health Problem." This lecture is so arranged that it can be illustrated with 19 slides or used without slides.

A letter descriptive of the lecture was sent to the 200 granges in the State, offering the use of the lecture free of charge, and stating that it is so arranged that a member of the grange can read it, or that the League will try to furnish a lecturer, if necessary. Up to date it has been used four times, the lecture being twice delivered by the chairman of the committee, Prof. Hilliard.

REPORTING CASES.

In 38 of the cities and towns in the State there is an organization affiliated with the League. The Committee on Reporting Cases made a study of the number of cases and deaths reported in each of these communities for the seven years, 1908 to 1914. This study shows a neglect in reporting cases in many of these cities and towns,—in fact, in some of them the number of cases reported is *less* than the number of deaths reported.

This study was sent to each one of these organizations with the suggestion that they take such action as might remedy this neglect.

A number of these organizations replied, stating they would take the matter up with the local board of health. The secretary of one wrote that for several years she had seen personally every doctor in town in regard to making reports of cases. The president of another organization said he would write to every physician in his city if necessary, and the State Department of Health said they would take the matter up through their district health officers.

The committee also compiled statistics on the reporting of cases and deaths in Massachusetts for last year,—January, 1916, to January, 1917,—as follows:

Reports of Cases and Deaths in Massachusetts January, 1916 to January, 1917.

Cities and Towns:	Pulmonary		Other Forms	
	Cases	Deaths	Cases	Deaths
200,000 and over (Boston)	2256	1111	207	*127
150,000 to 200,000 (Worcester)	372	201	36	70
100,000 to 150,000	1476	743	111	158
50,000 to 100,000	834	460	87	102
25,000 to 50,000	1108	469	116	123
10,000 to 25,000	718	407	42	82
5,000 to 10,000	551	404	41	53
2,500 to 5,000	128	142	10	29
2,500 and under	106	359	5	36
Totals	7549	4296	655	780

* First five months not reported

RED CROSS SEALS.

At the end of last year's Red Cross Seal campaign, a specially appointed committee drew up suggestions for the expenditure of the money raised by the sale of seals, and sent it to each agency in the State for its guidance.

The returns for this year's campaign are all in, and the total number of seals sold is 2,816,241, valued at $28,162.41. This is an increase over last year of 497,645 seals.

After deducting the amount due the National Association, $2,775.43, and the expenses of the State campaign, $837.87, $124.55 of which was contracted by the League,—we have for the use of the 94 organizations engaged in the fight against the disease in the State, $24,549.11. Of this amount, $2,249.05 is the League's share. This is the main source of income for the League, as it cannot solicit funds in communities where anti-tuberculosis organizations are located.

INSTRUCTION ABOUT TUBERCULOSIS.

There is a State law which requires that instruction in the prevention of tuberculosis be given in all public schools, but many tuberculosis workers throughout the State believe that very little attention is paid to this law.

In view of the general belief that tuberculosis in most instances begins in childhood, and that it is possible to impart to children much valuable information that may help in preventing infection, we hope that school committees, if they are not already doing so, will see that more attention is paid to this subject.

Last year the State Department of Health and the State Board of Education worked out a coöperative plan for the medical inspection of school children. This plan also included instruction in hygiene and preventive measures. A bill to provide the necessary funds was presented to the Legislature, which, however, failed to comply with the request of the Departments. We hope another effort will be made, and if so, that it will be supported by all the anti-tuberculosis associations in the State.

The anti-tuberculosis associations might very well find out what is at present being done by the school authorities in their own community in regard to school instruction upon the prevention of tuberculosis.

LOCAL ASSOCIATIONS AND AFFILIATED SOCIETIES.

The following organizations have been added to the membership of the League during the year:

1. Berkshire County Red Cross Chapter.
2. Brockton Visiting Nurse Association.
3. Lowell Anti-Tuberculosis Council.
4. Danvers Visiting Nurse Association.

This brings the total organization membership up to 40.

MISCELLANEOUS.

The League took an active part in urging various communities in the State to send to the National Tuberculosis Association such evidence as they had that would assist in locating the Community Tuberculosis Experiment in this State. This interesting experiment, under the direction of the National Tuberculosis Association, has been located at Framingham and is now under way.

In order to coöperate with the movement to discourage the sending of tuberculous patients with insufficient funds to the West and Southwest, the League has signed the transportation agreement of the National Conference of Charities and Correction. The League has also urged other anti-tuberculosis associations in the State to sign this agreement.

THE PROBLEM.

What is the problem in this State, and what equipment have we to handle it?

With a record last year of 5102 deaths from tuberculosis, all forms, 4312 of which were pulmonary, we still have in this State a big problem before us. The total number of cases reported for the same period was 8537, of which 7878 were pulmonary. Using the method of estimating the number of persons in a community with tuberculosis adopted by the Tuberculosis Commission of 1910, we have in the State today about 30,000 persons ill with the disease.

To care for these patients we have, all told, 58 public and private hospitals, sanatoria and boarding houses, with a total of about 3351 beds. This same tuberculosis commission states that we should have between 5000 and 6000 beds. The new county tuberculosis hospitals should add several hundred beds. The balance needed must be secured with the aid of the State departments, the 50 anti-tuberculosis organizations and committees, and of others interested in the problem.

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Book Reviews.

Health in the Camp. By H. R. KENWOOD, Temporary Lieutenant-Colonel, R. A. M. C. Toronto, Canada. 1916.

A small brochure of fifty-eight pages has been written by this author to provide adequate information to the soldier on all important topics of camp sanitation and personal cleanliness. These are discussed in a simple, untechnical manner and, while but brief space is given to each subject, enough is said to impress upon the non-medical mind the importance of care and thoroughness in sanitary matters. The book can easily be carried in the pocket and the information therein contained should be a part of the equipment of every soldier.

Practical Urinalyses. By B. G. R. WILLIAMS, M.D., Director Wabash Valley Research Laboratory. Illustrated. C. V. Mosby Co. 1916.

The author of this book states that this manual is not to be regarded as anything aiming at completeness, but as a guide for the student and practitioner in those diagnostic matters likely to be encountered from day to day. Much emphasis has been placed upon findings often considered minor and but little attention given to questions which might interest the specialist or research worker. These outlines have been prepared in the hope of emphasizing many of the little points which are often lost in the complexity of the large book. The book contains one hundred and forty two pages.

Clinical and Laboratory Technic. By H. L. McNEIL, A.B., M.D., Adjunct Professor of Medicine and Instructor in Physical Diagnosis, University of Texas Medical School, Galveston, Texas. Illustrated. St. Louis. C. V. Mosby Co. 1916.

This volume of eighty-eight pages is divided into three parts. Part I deals with history taking, Part II with the physical examination and Part III with the common laboratory methods used in diagnosis. This latter section includes examination of the urine, the blood, sputum, gastric contents, duodenal contents, feces, spinal fluid, the serous exudates and transudates, the Wassermann reaction and the gonococcus fixation test. The Appendix lists the common stains used in the laboratory. All the laboratory tests mentioned, as well as the routine methods described for history taking and physical diagnosis are in common use in the medical clinics of the John Sealy Hospital. The volume itself was originally designed for the use of advanced students in the Medical Department of the University of Texas Medical School.

The Institutional Care of the Insane in the United States and Canada. By HENRY M HURD, WILLIAM F. DREWRY, RICHARD DEWEY, CHARLES W. PILGRIM, G. ALDER BLUMER and T. J. W. BURGESS. Edited by HENRY M. HURD, M.D., LL.D. Vol. III, illustrated. Baltimore: The Johns Hopkins Press. 1916.

This bulky third volume continues and completes the third part of the elaborate work undertaken by the Johns Hopkins Hospital to present the history and present methods of institutional care of the insane on this continent. It deals alphabetically with hospitals for the insane in the states from Montana to Wyoming, inclusive, and in the dependencies of the United States, namely: Alaska, Hawaii, the Philippine Islands and Porto Rico. It is illustrated with twenty-four full-page plates representing the grounds and buildings of various institutions. The volume consists of 880 pages and completes a valuable work of compilation of which the usefulness to specialists as a book of reference is undoubted.

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THE WAR MEETING OF THE CLINICAL CONGRESS.

The meeting of the Clinical Congress of Surgeons in Chicago was notable for many reasons. It was honored by the presence of Secretary Daniels, who spoke at the first session, and of Surgeons-General Gorgas and Braisted, who attended almost all the evening meetings, and made several addresses. Much of the success of the Congress was due to the presence of Sir Berkeley Moynihan, whose service at the front, beginning the day after war was declared, and his later important position in charge of the war hospitals through a large district in England, has placed him in a position to add much to our knowledge of the contributions which British and French surgeons have made to war surgery, and whose graceful diction and unusual command of the English language especially fit him to impart what he had seen and done. Major George W. Crile had been given a furlough and he crossed the submarine-infested ocean, in order that he might give his message to the Congress. He spoke most interestingly in the discussion of war wounds and their treatment, agreeing in the main with Sir Berkeley, that while the various special methods, such as the Carrel-Dakin, the "Bipp" method of Rutherford Morison, Sir Almroth Wright's methods and others, all contained valuable points, the first essential to a rapid convalescence was access to a competent surgeon in a properly equipped hospital near the front, who could, if possible, excise the wound of its contaminated contents, and dress it by suture. If this were done early enough, the antiseptic treatments, some of them rather complicated, would often be rendered unnecessary. Dr. Crile had many suggestions for the organization of our hospitals behind the lines, and the utilization of the personnel, which will undoubtedly prove of value in the organization of our Medical Corps.

Among the principles brought out by Sir Berkeley were the demonstrations by experience on the British and French fronts, that wounds of the chest and abdomen would better be operated upon as near the front as possible, namely, at the casualty clearing stations, and that injuries to the skull and brain were better sent to the base hospitals, and attended to more at leisure, after neurological consultations and more deliberate study.

Sir Berkeley's paper on "Chest Surgery" was especially notable. Among the principles brought out by the war was the very important one that open lacerated wounds of the chest wall were best excised, cleansed and closed by suture, if possible, the same principle applying to wounds of the knee-joint, as brought out in a paper on this subject by the same distinguished author, which will be published in an early number of this Journal. Penetrating bullet wounds of the chest and lung often did well with no other treatment than cleansing the wounds and immobilization. Small projectiles lodged in the lung often gave no trouble and might be safely left.

Hemothorax, if the collection of blood was small and sterile, often took care of itself, and if large, might be relieved by one or more tappings. Infected hemothorax required radical surgery. The path of missiles, bits of shell-covering, etc., through the lung was curiously straight, and not tortuous, as it so often is in the other soft tissues, but the passage through any one part of the lung often caused pathological changes at distant portions of this lung, and even of the lung on the opposite side.

Large projectiles lodged in the lung, or smaller ones which caused trouble, were safely and satisfactorily removed by an incision five or six inches long over the fourth rib. The rib might be removed after clearing off the pleura, or might be sectioned at the anterior end, bent back during the operation, and replaced. The pleura being incised, it was easy, through this incision, to draw the lung out onto the chest wall, and foreign bodies could thus be felt with surprising ease, removed, and the incisions sutured with mattress sutures of catgut, as one would suture a liver. The lung being returned, a little ether was poured into the cavity, and the pleura sutured. An aspirating needle introduced through the 8th or 9th interspace allowed the escape of the ether vapor, and was followed by the expansion of the lung. The next day the average patient was no worse off than is the case after the removal of the appendix in the same interval, and recovery was the rule.

During the Congress the Committee on State Volunteers held many important meetings, and steps were taken toward the organization of a senior medical reserve corps, composed of men who, on account of age or other valid reason, were not eligible for the Medical Officers Reserve Corps.

Congress was memorialized regarding the necessity of universal military training for our youth.

Within brief limits it is impossible to set forth the many activities of the Congress, and for patriotic reasons all those who were unable to be present should read in the Transactions when published.

THERAPEUTIC VALUE OF FOOD ECONOMY.

One of the many good results that may ensue out of the "unmitigated evil" is the food stringency that is rendered necessary as a part of the general economy enforced in war times. For those who view the prospect of food shortage with a great deal of alarm, attention can be called to the fact that after three years of warfare under rationing, the fighting intensity is undiminished. On the contrary, every one is the better for it. Even aside from the wrong of waste, it is quite well understood that overeating lays a great deal more stress on the system in the conversion and excretion than is intended. Not only is energy wasted in taking food in and out of the body,—food that the body does not need,—but a great deal of it remains to act as a toxic agent. Besides, much of this energy so wasted could be used by the body in utilitarian pursuits. That the production of toxic products as a result of overeating is at the bottom of many of the constitutional or metabolic disturbances needs no additional proof. Boas (*Berliner Klinische Wochenschrift*) holds that it is the food restriction that is to be credited with the marked decrease in the incidence of diabetes in Germany. It helps materially to bear out the principle in Allen's treatment of diabetes by periodic starvation, and by maintained restriction in the quantity of food consumed. Gout, arteriovascular and renal conditions are, likewise, concerned in excessive food intake. They are certainly much benefited by restriction in this intake. Chittenden has long ago demonstrated that every individual consumes about twice as much food as the body can actually utilize. It needs no great stretch of imagination to see that half the food consumed in this country would pretty nearly feed whole nations. No one now rationally advises forced feeding in malnutrition, tuberculosis, etc., because the organism cannot assimilate more than an amount equal to its physical capacity. An excess can only do harm. Instead of forced feeding, it must be adequate feeding—adequate under the particular circumstances. There is often more harm in overfeeding than in underfeeding. It is comparatively seldom that the physician is called upon to prescribe for the effects of underfeeding, but much of his practice is taken up with the bad effects of overfeeding.

A diet restricted as to quantity but not as to variety is more satisfactory than a diet unrestricted in quantity but restricted in variety. If the variety is limited, the quantity consumed is by so much larger because the body tries to get out of this one food as much of the necessary food elements as possible. Hunger is sooner appeased by a mixed diet of small total quantity than otherwise. No quantity of food helps unless it contains the necessary food elements, especially vitamines. A mixed diet even of starvation quantity satisfies the needs of the body more adequately than one of less variety and not so apportioned. The malnutrition of the poor is not due to underfeeding in respect to quantity, but rather in respect to variety and quality. The less the variety the greater the quantity consumed. Both as a measure of economy in food, and in order to get all the necessary food elements in the minimum amount of food—the smallest total quantity on which the body can normally subsist—it is necessary to arrange the dietary according to a standard table of dietetics and apportioned according to sex, age, weight, physical condition, etc. Any other economy based upon a haphazard attempt to restrict the amount of food consumed must result in malnutrition, constitutional disturbances, and must defeat the very purpose of economy. The physiologic needs of the human body with respect to food are pretty definitely defined. This is the time to follow out intelligently the scheme of physiological feeding.

MEETING ON WAR SURGERY.

The meeting on War Surgery of the Boston Medical Library and Suffolk District Medical Society, which will be held in the Medical Library on Nov. 21, will, it is hoped, be addressed by Col. Thomas H. Goodwin, who comes to this country with the British Mission, and is now on duty at the Surgeon-General's office in Washington, and by Colonel C. Dercle, who represents the French Surgeon-General in the same capacity. Physicians from Massachusetts and New England are cordially invited, and a large attendance is especially desired, in order to stimulate enlistment in the Medical Reserve Corps.

MEDICAL NOTES

Graduation of New Hampshire Nurses. The New Hampshire State Hospital Training School for Nurses graduated on October 24, eleven nurses. Dr. Charles P. Bancroft made an address at the graduation exercises.

Medical Meeting. The Department of Labor and Industry will hold its Fifth Conference of Industrial Physicians and Surgeons at the State Capitol, Harrisburg, Pa., on Nov. 20, 1917. A most cordial invitation is extended to all physicians to be present and take part in this meeting.

The morning session will be devoted to a consideration of the medical and surgical problems of several of the largest industries representative of Pennsylvania.

The afternoon session will take up the question of industrial diseases. At this meeting Dr. T. Grier Miller and Dr. Henry F. Smyth of the Occupational Disease Clinic of the University of Pennsylvania will make public, for the first time, the results of some of their investigations carried on during the past year.

The program throughout is one of unusual interest and timeliness and one that will appeal to every physician. Copies of the completed program may be obtained by addressing Dr. Francis D. Patterson, Chief, Division of Industrial Hygiene and Engineering, 506 Kunkle Building, Harrisburg, Pa.

The Fifth Annual Welfare and Efficiency Conference of this Department will be held on the two days succeeding the Physicians' Conference. Subjects of more general interest, but none the less vital, will be discussed at these meetings.

American Association of Electrotherapeutics.—The association formerly known as the American Electro-Therapeutic Association has changed its name to the American Association of Electrotherapeutics and Radiology, and has chosen as its president Frank B. Granger, M.D. Other officers are as follows: Vice-Presidents, V. C. Kinney, M.D., Wellsville, N. Y.; William L. Clark, M.D., Philadelphia, Pa.; William Martin, M.D., Atlantic City, N. J.; Alfred T. Livingston, M.D., Jamestown, N. Y.; M. G. Campbell, M.D., Atlanta, Ga. Treasurer, Emil Heuel, M.D., New York City. Secretary and Registrar, Byron S. Price, M.D., New York City.

Clinical Congress of Surgeons.—At the eighth annual session of the Clinical Congress of Surgeons, held in Chicago during the week of October 22, Surgeon-General Gorgas stated that seven physicians and surgeons are being provided for each 1000 men of the American forces at the front. Great hospitals are being erected in France, he said, with one bed for every five men, or 200,000 beds. Provision also is being made at home for educating the maimed and crippled soldiers and sailors to some suitable trade

A conference was held by surgeons representing various States, and tentative plans were made for listing every medical man for service. It was reported at the conference that the Medical Officers' Reserve Corps still lacks 8000 of filling its ranks. The enrollment now is said to be about 14,000

Secretary Daniels of the Navy, in addressing the Congress, spoke of the evils of venereal disease in the Army and Navy. He stated that, during the last statistical year, men of the American Navy lost 141,378 days' sickness from a small group of absolutely preventable diseases. This means that every day throughout the year there were 456 men disabled. Add to that number those required to care for the disabled, and we have enough men on the noneffective list each day to man a modern battleship.

"In the Navy in 1915 there were admitted for treatment of such diseases 112 persons in every 1000 and in the Army 84 for every 1000, the number in the Army having decreased from 145 to the 1000 after the passage of an act stopping the pay of all soldiers admitted for treatment. The new Navy law stops the pay of men so afflicted, and will probably reduce the number to the Army ratio.

"In civil life, the number afflicted is quite as large proportionately as in the military service. It has been printed that Hecht of Vienna stated that at one time the equivalent of three entire Austrian divisions of 60,000 men was under treatment, while the German army in Belgium, representing only a small part of the total German forces, is reported during the first five months of its occupation to have furnished 35,000 such patients. Canadian and Australian officers have been depleted by the ravages of syphilis. The late figures from the British Army gave 78,000 cases and all other countries have also been weakened.

"The time has come to realize that this subtlest foe of humanity must be conquered and it cannot be conquered by denying its existence, saying it is a necessary evil or applying palliatives.

"It is deadlier than smallpox or cancer or tuberculosis. A Canadian authority says:

"'Its ravages today are more terrible for Great Britain and Canada than Vimy Ridge, the Somme and Lens.'"

An outline of the rules to govern the Army medical service was announced by Surgeon-General W. C. Gorgas, U. S. A., who has decided that the manual of 1914 will be in force with the medical units in France.

This means that the entire corps will be mobilized into three departments—medical, surgical and laboratory. In each department will be many specialists, but they will not be mobilized into a separate division. One general directing head is to supervise each of the three departments.

Honorary fellowship was conferred upon the following distinguished physicians: Surgeon-General Rupert Blue, United States Public Health Service; Surgeon-General William C. Gorgas, United States Army; Surgeon-General William C. Braisted, United States Navy; Colonel T. H. Goodwin, British Medical Corps; Colonel C. Dercle, French Medical Corps; Sir Berkeley Moynihan, Leeds, Eng.

WAR NOTES.

Sickness in Army Camps.—Report from Washington of the health of the soldiers in the army cantonments states that the average rate of sickness was 19.1. Camp Sheridan reported the smallest number of cases and Camp Devens took second place.

Base Hospital at New Jersey.—One of the finest base hospitals yet erected was formally opened at Camp Dix, Wrightstown, N. J., on October 23. The hospital has accommodations for 1500 patients and the two hundred buildings which comprise the hospital extend over an area of sixty acres.

Surgical Dressings Committee.—Upon the affiliation of the Surgical Dressings Committee with the American Red Cross, Mrs. F. S. Mead, Chairman of the National Civic Federation, who has also been Chairman of the Surgical Dressings Committee, has resigned that position, and Dr. John W. Eliot will succeed her. He will have as assistants Mrs. Charles Allen Porter and Mrs. Henry Lyman. The importance of the work of the Surgical Dressings Committee cannot be overestimated. It is now shipping one million dressings a month, and about one-quarter of the surgical dressings sent from America have been furnished by this committee and shipped from the workroom of the Peter Bent Brigham Hospital. Mrs. Mead, though retiring as chairman, continues as a member of the executive committee. The financial advisory committee will, as formerly, consist of Walter C. Baylies and George Wigglesworth, besides Dr. Eliot, and the surgical advisory committee will remain unchanged. This consists of Drs. Harvey Cushing, John W. Eliot, Robert B. Greenough, Charles Allen Porter and Hugh Williams.

War Relief Funds.—On Nov. 4, the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$284,470.03
Armenian-Syrian Fund	242,528.07
Surgical Dressings Fund	129,239.99
French Orphanage Fund	125,780.36
Serbian Distress Fund	124,384.17
Polish Fund	88,522.86
Italian Fund	50,742.94
Russian Refugees Fund	44,287.74
La Fayette Fund	32,811.03
War Dogs' Fund	1,752.25

BOSTON AND MASSACHUSETTS.

Hospital Bequest.—The Springfield Hospital, Springfield, Mass., receives, as a residuary legatee under the will of the late Sherman D. Porter, a share of $14,400, dividing this sum with the town of East Longmeadow.

Tuberculosis in Boston.—A survey of the number of cases of tuberculosis in the City of Boston since January first, has been made by the Health Department and the results are gratifying. Excluding cases reported more than once, the total number of cases is 2136. This is the lowest number on record. During this time the department's inspectors have made 8000 visits to the cases carried on the registry. One of the best means of preventing the spread of tuberculosis is that of cleaning and keeping clean the back alleys. The Health Department has done much work during the summer and fall, even though the number of inspectors was much too small for the purpose. Hundreds of notices were sent to property owners that their alleys were a health menace, and, in a majority of cases, the work of cleaning was carried out promptly and satisfactorily.

BOSTON DEATH-RATE FOR WEEK ENDING OCT. 27, 1917.—During the week ending October 27, 1917, the number of deaths reported was 203 against 227 last year, with a rate of 13.71 against 15.57 last year. There were 23 deaths under one year of age against 38 last year.

The number of cases of principal reportable diseases were: Diphtheria, 93; whooping cough, 13, scarlet fever, 26; typhoid fever, 7; measles, 34; tuberculosis, 53. Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 9; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 3; measles, 2; tuberculosis, 16. Included in the above were the following non-residents: Diphtheria, 1; tuberculosis, 2.

A TYPHOID CARRIER.—The following history of a typhoid carrier is given in the September issue of the *Massachusetts Public Health Bulletin:*

"In June, 1915, the proprietor of the L. farm in Gardner started a milk route. By August typhoid fever had occurred in three of the six families supplied by this farm.

During 1916 there were two more cases on this same route. In both years it was suspected that a typhoid carrier was employed on the farm. However, Widal tests and examinations of feces and urine from every one on the farm were negative.

In April, 1917, there was an explosive outbreak of typhoid fever numbering 20 cases, all of which were on the route of K., to whom L. sold his milk for distribution. A careful investigation by the State Department of Health, together with the local board of health, brought forth the fact that the proprietor of the L. farm had typhoid bacilli in his feces, although his blood was negative by the Widal test, and he denied ever having had typhoid fever. The sale of milk from this farm was prohibited.

On May 6, L. was again licensed to sell milk, with the agreement that he personally would have absolutely nothing to do with the handling of the milk or the utensils used.

In August, beginning the 16th of the month, 54 cases of typhoid were reported, many of which had their onset several days before a physician was called. All of these cases occurred on the route of the distributor, who obtained milk from nine dairies, including that of the L. farm. The sale of milk from all of the dairies concerned was stopped at once. Subsequently, Widal tests and examinations of the feces and urine of persons at eight of the dairies were negative. The ninth dairy was on the L. farm, being the same source of supply which was under suspicion in 1915 and 1916, whose proprietor was found to be a carrier in April of this year. Thus L. was proven to be an intermittent carrier with a negative Widal test.

The conclusion to be drawn is that no known typhoid carrier should be permitted to produce milk for sale or distribution, or to engage in any way in the handling of milk or other food products."

HOSPITAL BEQUESTS.—By the will of the late Marie Antoinette Evans, widow of Robert D. Evans, the Robert Dawson Evans Memorial for Clinical Research and the Massachusetts Homeopathic Hospital of Boston share in a residue of the estate, which may amount to $2,000,000. The Harvard Dental School receives a bequest of $25,000.

Obituary.

JAMES HOMER DARLING, M.D.

DR. JAMES HOMER DARLING, one of the oldest practising physicians in Connecticut and dean of the medical profession in Hartford County, died at his home in Thompsonville, Conn., on October 18, 1917. He had been in failing health for some months.

Dr. Darling was born in Cambridge, Lamoile County, Vt., July 25, 1838, a son of Hayes Pope and Aphia (Hubbard) Darling, natives of Pomfret, Vt., and Weare, N. H., respectively. The father was a hatter but in later life engaged in farming in Cambridge, Vt., and died in Johnson, that state, December 22, 1843. Dr. Darling spent his childhood in his native town, and his academic education was received in Northfield Academy. In 1856, he began the study of medicine in the office of his brother, Henry H. Darling, in Charlton, Mass., and in 1858 attended lectures in the Vermont Medical College in Burlington, from which institution he was graduated in 1859. Immediately following his graduation he began the practice of medicine in Rindge, N. H., remaining in that place until November, 1862, when he received the appointment of assistant surgeon of the 51st Massachusetts Volunteer Infantry by Gov. John A. Andrew, and remained in that service nine months.

In December, 1863, he was appointed acting surgeon in the United States Navy and served for two years in the East Gulf squadron. He received an honorable discharge in 1865, and began the practice of medicine in Keene, N. H. He remained there until 1875, when he removed to Thompsonville, Conn. Here he soon established himself in a large practice, which he retained up to the time that his health failed him.

The passing of Dr. Darling removes from Thompsonville one of its most respected and beloved citizens. He was a member of the Army of the Potomac and of the Army and Navy Club of Connecticut. He also had membership in the Hartford County Medical Association and was for many terms surgeon-general of the Samuel Brown Grand Army Post. He is survived by his daughter.

Miscellany.

SECTION OF SURGERY OF THE HEAD.*

The medical care of one million troops in the field will require the services of several thousand physicians. The Medical Corps of the Regular Army, one of the most carefully selected organizations of medical men, was not sufficient for the present emergency. Primarily, the corps was augmented numerically by the organization of the Medical Reserve Corps. By a careful distribution of the men of the regular corps, the influence of their long and thorough training permeated the new organization, forming a completed organization in which those inexperienced in military medicine were safely supported. The Medical Reserve Corps organized, the profession realized its responsibility and, in consequence, commissions were issued to a large number of physicians throughout the country.

Many of the members of the Medical Reserve Corps were detailed to various medical officers' training camps for the purpose of intensive technical and physical training. This assignment afforded the officers opportunity to obtain physical fitness and sufficient military experience to qualify them as regimental, ambulance, and sanitary officers. It also permitted the weeding out of the physically unfit, but did not afford opportunity to classify officers according to their professional attainments. The details of this training so consumed the time of instructors and students that it was impossible to judge of the fitness of the officers for special work.

Recognizing the need for specialists, the Surgeon-General, with the General Medical Board of the Council of National Defense, through the great medical bodies of the country, established in his office sections for the care of the various medical and surgical specialties. Physicians of high professional rank, many of them authorities in their chosen field, and in civil life acknowledged leaders, were selected to direct these sections. This plan of classifying the personnel of the military medical corps, a new departure, is another example of the far-sighted preparation now so conspicuous in every branch of the service.

The various needs of the service demanded the establishment of eight sections, namely, Internal Medicine, General Surgery, Orthopedic Surgery, Venereal, Skin and Genito-urinary Surgery, Surgery of the Head, Laboratories and Infectious Diseases, Neurology, Psychiatry and Psychology, and Roentgenology.

The section of Surgery of the Head, made up of the sub-sections of Ophthalmology, Otolaryngology, Plastic and Oral and Brain Surgery, developed from a similar organization of the General Medical Board of the Council of National Defense.

In the office of the Surgeon-General, the section as a whole is under the direction of a Lieutenant-Colonel of the regular corps, and to each sub-section is assigned a member of the Medical Reserve Corps. These officers act in an advisory capacity in the selection of personnel, etc., and outline the policies under which the work is to be carried on.

Those in charge of Ophthalmology and Otolaryngology found their chief function in acquainting the physicians of the country with the fact that the Surgeon-General was desirous of using the specialist, as far as possible, in his specialty, and in listing the names of the physicians who came into the Medical Reserve Corps with a view to work in their specialty. They have aided the Surgeon-General to select and assign the proper personnel to the base hospitals at the various cantonments. At the present moment, the selection of the personnel for the base hospitals, which are destined eventually for duty abroad, engages their attention.

The officers in charge of the sub-section of Plastic and Oral, and Brain Surgery were confronted with the fact of the great scarcity of surgeons familiar with the special technic so necessary in the successful management of injuries of the face and head. It was necessary to use this small group of qualified surgeons to instruct others, and thereby build up a corps of sufficient size to enable assignment of specially trained surgeons to the various hospitals. A conference of the recognized authorities, held in Washington, developed the fact that the large universities were willing to assist in this professional training by tendering to the Surgeon-General the facilities of their medical departments and hospitals.

Schools, with teaching staffs of surgeons versed in the details of special branches, were established. The course of instruction includes anatomy, physiology, symptomatology, operative exercises on the cadaver and animals, splint-making, clinical demonstrations, and didactic lectures.

In the selection of students, the sub-section of Plastic and Oral Surgery first considered a group of surgeons, commanding excellent technic, but lacking in the necessary special refinements. Secondly, the members of the dental profession, many having medical degrees, who have concentrated their studies upon peridental tissues, the jaw bones, and structures of the mouth, and consequently familiar with the special details of the treatment. The correlation of the technic so as to enable the individual surgeon to command the combined knowledge can well be accomplished in these courses.

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* This description of the activities of the Section of Surgery of the Head, in the Surgeon-General's office, has been sent by the Surgeon-General to several of the medical journals of the country.

In a like manner, the successful neurological surgeon must, in addition to his general surgical training, have some knowledge of neurology and be trained in the special technic of surgery of the nervous system. The imparting of this special training could best be accomplished by similar schools. With the assistance of the leading members of the profession throughout the country, a list of candidates for these schools has been compiled. These candidates, in groups of twenty-five, are assigned to the schools for a period of intensive fundamental training. When this course is completed, it is planned to give the more competent surgeons an opportunity to continue studies in the various clinical centers of the country. Selected groups of these officers, well grounded in the fundamentals, can later be more specially qualified through a course of clinical instruction at the front.

In this manner the important period of preparation, so necessary for the accomplishment of rapid expansion of all branches of the service, will be most wisely used.

When the troops are engaged and many beds of the various hospitals are occupied by soldiers with injuries of the head, assignment of these surgeons who have had special training to assume the responsibility of these cases should result in the utmost efficiency. In the unit for Plastic and Oral Surgery, a general surgeon will have associated with him a dental oral surgeon, who, having gone through a course of intensive training, will be fitted to obtain the very best results through their correlated skill. Likewise, the officer of the sub-section of Brain Surgery, necessarily somewhat divorced from the competent neurologist, will have keen judgment and undertake with clearness his responsibility.

The fact is evident that it is not the intention of the Surgeon-General to make special surgeons by means of a short course of instruction, but add the necessary special knowledge to the equipment of surgeons. This special knowledge will not interfere with the general usefulness of the surgeon in the performance of any duty which may fall upon him as a member of the Military Medical Corps.

* * *

HOSPITAL SHIP.—The steamship *Prince Arthur*, for many years plying between Boston and Yarmouth, N. S., has been taken by the British Government and converted into a hospital ship for use in the war zone. Its sister ship, the *Prince George*, has been engaged in hospital service for several months.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR SEPTEMBER, 1917.

A TOTAL of 3005 cases of communicable diseases was reported for September, a decrease as compared with 3167 in August of the current year and 3147 in September, 1916.

This decrease is deceptive in the comparison with September, 1916, for 623 cases of poliomyelitis were reported for that month, whereas but 16 cases were reported for September of this year.

Diphtheria, scarlet fever and measles all show an increase, diphtheria especially, which indicates the necessity for early medical attention, prompt action in the use of antitoxin for treatment and the immunization of non-immunes who have been in contact with a case of diphtheria.

Anthrax.—Six cases of anthrax were reported from four communities. Five of the cases handled hides in the beam house or soak room of a leather factory, and the hides from which the infection was received were from China. The remaining case handled hides from Argentina, South America, at a railroad freight office. These cases were infected by 4 separate lots of hides, 2 of the cases receiving their infection from the same source.

Epidemic Cerebrospinal Meningitis.—There were but 9 cases of this disease reported for the month, a decrease as compared with 19 cases in August.

Lobar Pneumonia.—Lobar pneumonia was made reportable in May of the current year. The reports which have been received show that it reached its lowest prevalence in August, but is now on the increase throughout the State, as will be seen by the following distribution of cases: May, 360; June, 277; July, 80; August, 57; and September, 80.

Poliomyelitis.—There were 16 cases reported, a marked falling off compared with the 39 cases reported in August.

Smallpox.—One case of smallpox was reported from Winchendon. The source of infection was not found.

Typhoid Fever.—Two hundred and sixty-four cases of typhoid fever were reported, a decrease of 105 cases when compared with 369 cases reported for September, 1916.

Typhoid Carriers.—Two typhoid carriers were located during September.

One of these had typhoid in April of this year and his father had typhoid in September. Typhoid bacilli were found in a specimen of feces for the first case—the carrier.

The second carrier conducted a small boarding house, and a history of the boarders shows that she apparently has been responsible for 5 cases of typhoid since August, 1916. The carrier denied ever having had typhoid fever, but the laboratory result showed an atypical Widal test, and typhoid bacilli were found in a specimen of feces.

Diseases on the Premises of Milk Handlers.—In 4 instances during the month, communicable diseases were reported on the premises of milk handlers. Typhoid fever was reported in 3 cases, one being a driver on a milk team and the other 2 being individuals on milk-producing farms. A case of diphtheria occurred on the other farm. Fortunately, no secondary cases are known to have resulted from these cases.

EPIDEMICS AND OUTBREAKS.

Typhoid Fever in Tewksbury State Infirmary.—An outbreak of 54 cases of typhoid fever occurred during the last two weeks of September, and 2 cases occurred on October 2.

The explosive character of the outbreak indicates it to be due to infected food, in all probability, as all of the cases ate their meals or worked in one dining-room.

The first seven cases reported were nurses or attendants, and of the 56 cases, 49 were physicians, nurses or attendants, and 7 were inmates.

Immediate investigation ruled out the water supply, and as the milk supply was common to the whole institution and pasteurized, it was also ruled out.

The cream for the dining-room where the outbreak occurred was found to be unpasteurized and to come from three farms. Also, one of the nurses took milk from an outside farm. Inquiry at these four farms disclosed no new employee, and all gave a negative Widal test.

Up to the time of going to press, a waitress and a nurse have been found with atypical Widal reactions and are under suspicion. As yet, typhoid bacilli have not been demonstrated in a specimen of feces.

Great difficulty has been encountered by institutions in attempting to give the typhoid prophylactic to all attendants and employees as they invariably threaten to leave; but now once again the fact has been shown that the occasional loss of an employee due to refusal to take the prophylactic is better than to lose a large number by a typhoid outbreak.

Typhoid Fever in Gardner.—Following the epidemic of typhoid fever in Gardner in August, when 54 cases were reported, 9 cases were reported this month. Six of these cases were found to be secondary cases in contact with patients of the August epidemic.

Diphtheria in Fitchburg.—In Fitchburg an interesting condition was found on questioning a family as to where the 2 cases in their family may have "caught" the sickness. They replied that a neighboring house had several cases of sore throat. Clinical symptoms and culturing proved the latter to be cases of diphtheria, although no physician had been called.

Diphtheria in Malden.—A school outbreak of diphtheria was prevented in Malden. Two cases were reported in the same schoolroom. On the following day cultures were taken from all the pupils in the room, and three of the fifty swabs were positive. A second room was cultured and six positive cultures obtained from the 62 swabs taken.

Since the finding of these positive sources of spread by culturing, only two new cases were reported the next ten days.

The origin of the outbreak was apparently through children in the same family who were ill before the opening of school.

Diphtheria in Erving.—A small outbreak of 12 cases was reported from Erving. Of these, 10 were in the same school. Culturing of 142 pupils were all negative.

Diphtheria in Melrose.—There were 20 cases of diphtheria reported during August, and when school started an increase in cases occurred. Twenty-one cases were reported in September. The prompt culturing by school physicians disclosed several carriers, including nasal carriers.

Dysentery.—From September 11 to 30, 57 cases of bacillary dysentery were reported from the Medfield State Hospital, only 2 of the cases being employees. The disease apparently originated among the inmates.

RARE DISEASES.

Actinomycosis was reported from Boston, 1.

Anterior Poliomyelitis was reported from Cambridge, 1; Fall River, 2; Greenfield, 1; Haverhill, 3; Lowell, 1; Malden, 1; Merrimac, 1; Quincy, 1; Reading, 1; Revere, 1; Somerville, 2; and Whitman, 1.

Anthrax was reported from Berlin, 1; Hudson, 1; Peabody, 1; Winchester, 1; and Woburn, 2.

Cerebrospinal Meningitis was reported from Boston, 1; Brookline, 1; Cambridge, 1; Chelsea, 1; Lynn, 1; Lowell, 2; Northampton, 1; and Salem, 1.

Dog-bite was reported from Canton, 1; and West Boylston, 1.

Dysentery was reported from Boston, 1; Braintree, 1; Acushnet, 1; Greenfield, 2; Lawrence, 6; Medfield, 57; and Westboro, 5.

Hookworm was reported from Boston, 1.

Malaria was reported from Boston, 4; Brookline, 1; Dedham, 2; Haverhill, 2; Newton, 2; and Worcester, 1.

Pellagra was reported from Boston, 1; Tewksbury, 1; and Northampton, 1.

Septic Sore Throat was reported from Ayer, 1; Dedham, 1; Haverhill, 1; Lowell, 1; Lynn, 1; New Bedford, 1; Warwick, 1; Webster, 1; and Wendell, 2.

Smallpox was reported from Winchendon, 1.

Trachoma was reported from Boston, 1; Lawrence, 2; Malden, 1; and Worcester, 1.

NOTICE.

The Harvey Society.—The second lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, November 10, 1917, at 8.30 p.m., by Dr. Carl L. Alsberg, U. S. Department of Agriculture. Subject, "Current Food Problems."

SOCIETY NOTICES.

New York and New England Association Railway Surgeons.—The New York and New England Association of Railway Surgeons will hold its twenty-seventh annual session at the Hotel McAlpin, Broadway and 34th Street, New York City, on November 8, 1917, under the presidency of Dr. H. G. Stetson of Greenfield, Mass.

H. G Stetson, *President*.
George Chaffee, *Corresponding Secretary*.

Bristol South District Medical Society.—Meeting at rooms of Chamber of Commerce, Fall River, Thursday, November 8, at 5 p.m. Dr. Daniel F. Jones of Boston will speak on "Personal Experiences at the Front, in France."

A. J. Abbe, *Secretary*.

RECENT DEATHS.

Silas Dean Presbrey, M.D., ex-president of the Massachusetts Medical Society, died at his home in Taunton, October 23, 1917, of angina pectoris, aged 79 years.

Henry Julius Cohen, M.D., of New York City, died in that city recently, following an operation for appendicitis. Dr. Cohen was thirty years old and was in charge of the eye clinics of the Jewish and Samaritan Hospitals in Brooklyn. He is survived by his widow and a daughter.

Linnaeus Victor Gibbs, M.D., a retired Fellow of the Massachusetts Medical Society, died at Huntington, his home, October 17, 1917, aged 76 years. He was a graduate of the University of Vermont School of Medicine in 1880, and joined the Massachusetts Medical Society from Worthington in 1886.

Pitt H. Jones, M.D., of Springfield, Mass., died suddenly in that city October 17. Dr. Jones graduated from the College of the City of New York in 1883 and had been in practice in Springfield ever since. He was interested in politics and had served two years in the House of Representatives. He was City Treasurer at the time of his death.

Silas Pinckney Holbrook, M.D., a retired Fellow of the Massachusetts Medical Society, died at Farnumsville, October 2, 1917, aged 79 years. He was a graduate of the University of Pennsylvania School of Medicine in 1862, and joined the Massachusetts Medical Society and settled in practice in East Douglas, Mass., in that year. There he lived and practised, being a councellor from the Worcester District Medical Society for many years.

Joseph Lewandowski, M.D., of Boston, died at his home at 406 Marlboro Street, on October 25. Dr. Lewandowski was educated at Cracow University, Austria, and afterward studied in Vienna and Paris. He practised in Boston for seventeen years and devoted considerable time to delivering lectures to Polish people in Massachusetts cities and towns. He made a specialty of tuberculosis and hygiene, and his work along these lines became widely known. He is survived by his widow.

Edward Manning Brown, M.D., died at the Springfield Hospital, October 22, 1917. He was born in Springfield, February 25, 1872, the son of Timothy M. and Elizabeth Chapman Brown, was educated at the Sheffield Scientific School of Yale and at the College of Physicians and Surgeons, Columbia University, where he took his M.D. in 1898. He was a Fellow of the Massachusetts Medical Society. He is survived by two children, his wife, Elizabeth Pettinger Brown, having died in 1907.

Sarah F. Norris, M.D., a retired physician, died at her home in Hyde Park, on October 8. Dr. Norris was born in Plymouth, N. H. She received her education and medical degree in Boston. Under the auspices of the Congregational Board of Foreign Missions, she went to Western India and worked with great faithfulness for many years among the poorer classes of Bombay. In 1905, Dr. Norris returned to America and settled in Hyde Park where she lived until the time of her death. She is survived by two sisters.

Mary Darrach, M.D., founder of the Darrach Home for Crippled Children in New York City, died at Atlantic City, N. J., on October 25. Dr. Darrach was the daughter of Dr. Marshall Darrach of Newark, an inventor and manufacturer of devices for the use of crippled persons. She taught for many years in schools for crippled children, and later studied medicine at the Women's College. In 1896 she founded a home where crippled children could live until able to earn their own living. She was also interested in other charitable work and was a member of the Children's Aid Society of New York City.

MARRIAGE.

Dr. Stanley B. Weld of Winchester, Mass., was married, on October 25, to Miss Sara Frances Felber of Boston, daughter of Mr. and Mrs. Gustave A. Felber. Dr. Weld was graduated from Harvard Medical School in 1916. They will reside in Hartford, Connecticut.

APPOINTMENTS.

Harvard Medical School. Dr. Edward Wyllys Taylor has been appointed professor of neurology.

Harvard Dental School. Dr. Percy R. Howe has been appointed professor of dental research.

Northwestern University Medical School. The following appointments have been made for the year 1917-18: Dr. Frederick G. Harris, professor of dermatology and syphilology; Dr. Joseph Zeisler, professor emeritus of dermatology; Dr. Frank C. Becht, professor of pharmacology; Dr. John Ridlon, honorary professor of orthopedic surgery; Dr. John L. Porter, professor of orthopedic surgery; Dr. Herbert A. Potts, professor of oral surgery; Dr. Frank E. Simpson, adjunct clinical professor of dermatology; Dr. Charles P. Caldwell, adjunct clinical professor of medicine; and Dr. Edward L. Moorhead, adjunct clinical professor of surgery.

Dr. B. Frank Knause, of Brooklyn, N. Y., has been appointed deputy commissioner and sanitary superintendent of that city.

The Boston Medical and Surgical Journal

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Original Articles.

STUDY OF THE OPERATIVE TREAMENT OF OSTEOARTHRITIS OF THE HIP JOINT.

BY DR. OZARKI, JAPAN.

I. INTRODUCTION.

THE following report is based upon the study of the end-results of forty cases of operation on the hip joint. The series includes 26 cases of osteoarthritis, ten cases of old tuberculosis, three cases of old congenital dislocation, and one case of old fracture of the neck of the femur. Of the cases of osteoarthritis, twenty-three were diagnosed clinically as "hypertrophic arthritis," and three as "old infectious arthritis." The operations, covering a period of eight years (1908-1916), were performed, with a few exceptions, by Dr. E. G. Brackett, and included two cases of arthroplasty for hypertrophic arthritis, two cases of excision of the head of the femur for hypertrophic arthritis, and one similar operation for old tuberculosis, one arthrotomy for congenital dislocation, and the remaining cases arthrodesis or an Albee operation for artificial ankylosis.

Except in a few cases of polyarticular osteoarthritis, the condition at the time of operation might fairly be considered as a residuum of an arrested or localized process, and the operation was performed only in the case of functional mechanical damage to the joint, accompanying the pain and other symptoms. In these cases surgical interference, especially a successfully performed arthrodesis, seemed to offer the best method for the relief of the disabling condition.

Before going into further detail regarding the operative treatment, it might be well to mention briefly the progress which has been made up to the present time in the understanding of this disease.

The cause of arthritis deformans has not yet been satisfactorily explained. The disease is multiple and varied in its manifestations, including such wide groups as the gonorrheal, the syphilitic, and the rheumatoid, and those due to faulty metabolism, nervous influences, etc. Pathologically, there are two distinct types, called by Nichols and Richardson the proliferative and the degenerative types. In this treatise we can report a series of twenty-three cases of osteoarthritis of the degenerative type, all except a few showing some hypertrophic overgrowth, the so-called hypertrophic arthritis. Among these cases there was more or less destruction of the articular cartilage and bony overgrowth, and some of the cases showed thickening of the capsule. The cause of the disease was not clearly understood, although in one of the cases the gonococcus fixation was weakly positive. It was not considered that the condition could be ascribed to syphilitic or rheumatoid arthritis, gout, faulty metabolism, nervous influences, etc.; and in some of the cases there were present such causative elements as traumatism, acute suppuration, pyorrhea alveolaris.

dental caries, chronic tonsillitis, constipation, etc.

In general, the causative factors of osteoarthritis have been considered to be traumatism, particularly fractures and dislocations, acute or chronic suppurative infections, gonorrhea, syphilis, probably faulty metabolism, gout, and disease of the central nervous system.

For all of these causative morbid processes, proper treatment should be instituted as soon as possible in the course of the disease, but in the large majority of the cases, when once the arthritic condition has started, the disease progresses with remissions for many years, and up to the present time no treatment has been found effectual.

Among the various methods of treatment which have been tried for the relief of the disease may be mentioned the salicylates, thymus gland, iodide, strychnine or other bitter tonics, iron, cathartics, massage, baking, hydrotherapy, etc.

In December, 1909, Dr. Thorkild Rovsing, of Copenhagen, Denmark, reported his method of injection of sterilized vaseline for the treatment of dry arthritis, which has proved very successful in many cases. The method is simple, and pain, creaking, and stiffness of the joint were relieved in a large percentage of the cases a few days after the operation, although in some there was a reaction with fever, increased pain, and slight swelling. The danger of the operation was embolism of the vaseline and infection, which, however, may be avoided by watchful care. In the hip joint in adults, 20 to 25 cc. of the vaseline was the amount preferred, and in the shoulder and knee, 15 cc., and if the quantity is carefully regulated by the available space in the joint, the undesirable reaction can generally be controlled.

Although this method of treatment has produced a beneficial effect in some of the acute cases, it has not been particularly satisfactory in those cases which have tended to progress intermittently, with an insidious pathological process, characterized by intervals of relief between a series of attacks. It must be borne in mind that it is the duty of the physician to try such methods, or any symptomatic treatment when the sufferer from a chronic disease, such as osteoarthritis, demands this relief.

Sooner or later we may expect to discover the definite etiology of the disease and to solve the problem of its cure, but at present we can only surmise that the disease will be found to be due to various kinds of microbes or to toxic material from other sources in the body; and the discoverer will be either the microscopist or the chemist.

The problem of the cure of the disease is a difficult one, for, although many specific microbes of acute and chronic affections have been discovered, no satisfactory, definite treatment, except in a few cases, has as yet been employed. This is especially true in the cases of chronic articular disease such as joint tuberculosis and gonorrheal arthritis, where the bacteriology and the accompanying pathological processes are fairly well understood.

Among the many reports of bacteriologic research in arthritis may be mentioned the interesting experimental work on rabbits, reported by Dr. Roades Fayerweather, of Baltimore. This work has demonstrated that the morphological appearances of villous proliferation of the synovial membrane in the knee joints of rabbits, produced by the inoculation of a pure culture directly into the joint (the organisms being isolated from acute polyarticular cases and cultivated on various media), bear little resemblance to the pathological processes of the proliferative arthritis. Although it was clearly stated that cases of the hypertrophic type of arthritis deformans were excluded, it is, nevertheless, a step in discovering the fundamental element of the ideal treatment for the disease.

At the present time syphilitic osteoarthritis can be diagnosed and definitely treated, but for the other types of the disease no therapeutic method has been discovered, so that the best plan to follow is to watch the course of the disease and assist nature in so far as possible. In the progressive cases with remissions, the patients suffer varying degrees of pain and disability. In the degenerative type with hypertrophic changes, complete repair of the damaged joints cannot be expected, although in syphilitic osteoarthritis, with much destruction, it is well known that after a natural bony ankylosis the disease ceases. Hence, arthrodesis is one of the most interesting operations to perform, and the most effective in the relief of the disability, especially in the hip joint.

It must be remembered that operation is only a part of the treatment of osteoarthritis, and that the etiological or general treatment of the case is also important.

Passive motion is contraindicated, as it tends to produce disturbance in the joint and thus hinder the cure. For the same reason, arthroplasty is contraindicated if there is any pathological process on the articular surfaces. Decapitation of the head of the femur may be applicable to cases in which there is immobility of the other hip or knee, in order to restore motion to a stiffened hip joint.

Arthrodesis has been considered the most advisible operation in the monarticular or traumatic cases.

Dr. Brackett, in an article published in July, 1915, says in regard to the operation: "In general, the operative treatment of osteoarthritic joints is applicable only: (a) when the disease is localized—monarticular, traumatic; (b) when it is the residuum of a process which has been arrested."

He also stated that the various pathological conditions and the operative procedures best adapted for their relief may be grouped as follows:

Malposition (mechanical strain)	Capsular disease without articular damage	Reduction of deformity for joint with good function	
	With articular destruction	Arthrodesis for obliteration of joint	
Hypertrophy of synovial membrane without bone change (rare)		Excision of isolated hypertrophic areas	
Osteoarthritic joint with overgrowth	(*a*) Interfering with normal action. Cartilage and capsule intact. Potential function in joint.	Removal of overgrowth	
	(*b*) Cartilage more or less destroyed, capsule contracted. No potential function.	Change in function of joint.	Removal of femoral head, or arthrodesis.

When the above table is compared with the report of cases it will be recognized immediately that the best procedure was applied for the relief of the patient. All the cases were either of long standing or had not been improved by any previous treatment.

Dr. Brackett, in a paper, February 15, 1912, has described the following methods of approach to the hip joint,—the inner route, the anterior route, the lateral route, the latero-posterior route, and the posterior route, and of these, the latero-posterior is the one used most frequently for operation, although the anterior and lateral routes are also used. The latero-posterior route gives the most extensive view of the hip and its surrounding structures, and is, therefore, best adapted in case of operation.

The Latero-Posterior Route. The lateral incision is made from the anterior-superior spine, obliquely downward and outward, to the middle of the outer side of the trochanter, and is then turned downward two inches, in the line of the femur. Especial care must be taken to end the vertical portion well up on the outside of the trochanter (1½ inches from the tip) and well down towards its posterior border. At the point where the oblique portion joins the vertical, just over the trochanter, an angular incision is made directly backward, two to three inches, down to the fascial portion of the gluteus maximus. After separating the tensor fascia femoris and the gluteus medius, the line of separation is extended downward along the line of the original incision, through the fascia lata, to the femur, freeing the attachments of the muscles (vastus externus) from the outer and upper surfaces of the femur. The fascial expansion of the gluteus maximus is then cut through, along the line of the posterior part of the original incision, and the outer part of the trochanter exposed. The outer and upper surface of the trochanter is then chiseled off by cutting directly backward with a narrow osteotome, and a curved line beginning on the outer surface of the trochanter, 1½ inches below the tip, and cutting inward to the fossa at the junction of the upper part of the neck and the trochanter. This removes the outer portion and tip of the trochanter, and with it the attachments of the gluteus medius, gluteus minimus and pyriformis. Care should be taken in the removal of this piece not to encroach on the neck, or the bone will be weakened at this angle. The portion of the bone removed, with the muscles attached, is deflected backward and upwards, and the muscular covering of the anterior fibers of the gluteus medius and minimus are easily separated from the region above the acetabular rim. The capsule may be split along its upper surface, parallel to the neck, and near to its acetabular insertion cut transversely on each side, which opens the view of the edge of the head and the rim of the upper half of the acetabulum. By rotation of the femur, the extensive opening allows the largest amount of the articular surface of the head to be brought into view, and thus, in operation on the articular structures, the opening gives a freer access than any of the other avenues of approach.

The Anterior Route. The incision, made from just below the anterior-superior spine directly downward five or six inches, exposes the line of division between the sartorius and tensor fascia femoris. At the upper portion, the fibers of the sartorius are nearly vertical, and parallel to the fibers of the tensor fascia femoris, but about three inches below its origin the outer edge of the muscle takes a rather sharp bend inward. The two muscles are easily separated, and this separation must be carried high, nearly to the point of their origin, where the two muscles are closely blended, having their origins much in common. Retracting the sartorius to the inside, the upper portion of the rectus is seen lying in the interval between the two. Retracting the sartorius and rectus to the inside, and lifting at the same time the outer edge of the iliacus, exposes the outer portion of the capsular cavity. Through this opening the anterior surface of the neck and the edge of the head may be brought into view, particularly when the thigh is flexed.

The Lateral Route. This avenue of approach to the hip joint is by the lateral incision described at the beginning of the latero-posterior route. In the center of the operating field is the dividing line between the tensor fascia femoris and gluteus medius.

Arthrodesis. In each case the surfaces remaining on the acetabulum and the head, neck, or upper part of the femur must be carefully refreshed in the way best adapted to meet the conditions caused by the destructive process. The usual procedure, however, is completely to refresh the upper part of the acetabulum by chiseling or scraping with an osteotome or sharp spoon, then shaping the remaining portion of the head, neck, or top of the femur to fit the refreshed acetabular surface and form a solid bony union.

Suture. After operation, the tissues must be stitched layer for layer with catgut, silk, or silver wire, using catgut for the deep sutures, and heavy silk to secure the muscular attachments to the trochanter, and also for the divided gluteus maximus and occasionally, also for the capsule. The skin may be sutured with silk or catgut. Wire has been used occasionally for holding the detached trochanter in place. For the capsule, the detached trochanter and the divided gluteus, interrupted sutures have always been used, but for the divided fascia, the muscles, subcutaneous tissue and the skin, either continuous or interrupted sutures may be applied.

After-Treatment. After arthrodesis the limb is immediately put up in a plaster-of-Paris spica, in an abducted position, with about 20 to 25 degrees of flexion of the hip and slight flexion of the knee. This spica, which extends from the foot, should include the thigh on the other side.

The patient is kept in recumbency in a long spica for eight weeks. Crutches and a short spica, with no weight-bearing, are used for two months, and crutches with weight-bearing and a bandage spica for one month. Five months after operation the patient may begin weight-bearing without crutches.

These rules, which are for the usual case, naturally do not apply if the union is delayed or does not take place satisfactorily.

II. REPORT OF CASES.

In any case where an operation is contemplated, the occupation of the patient, the family circumstances, the general health, and past illnesses must be taken into consideration. For instance, investigation should be made of the teeth, tonsils, nasopharynx, nasal cavity, gastro-intestinal tract, and lymphatic glands, as possible sources of infection. Traumatic causes or any purulent origin of the difficulty should be inquired into, and as early as possible in the course of the disease, the Wassermann, tuberculin, and gonococcus fixation tests should be carried out and bacteriological investigations instituted, in order to determine all possible factors which might influence the plan of treatment. In the present report all the cases considered were of old chronic disease, and mention of negative findings will, therefore, be omitted.

The factors in deciding upon operative interference have been disability of the hip joint, due to deformity, severe pain extending over a long period of time or produced by very slight motion or exertion, the x-ray appearances, and the amount of destruction found upon opening the joint. The cases in which the operation was considered necessary were those in which rest and mechanical protection failed to bring about relief. In nearly all the cases reported there has been destruction of the cartilage or the bone surfaces, with irregular erosion or overgrowth. Some of the cases have shown permanent distortion due either to the destructive process or to overgrowth following old fracture of the head or neck of the femur. The details of the condition found will be mentioned as the individual cases are reported.

In order that the end-results of the operations might be studied, the patients were asked to return after a certain interval for observation. Seventeen of the cases did as requested, and of these it was possible to take x-ray records of fourteen. Although this is less than half the number of the cases operated on, it is, nevertheless, a sufficient number from which to draw conclusions as to the ultimate outcome of the treatment, and the report of the cases will be carried up to the point to which it was possible to follow them.

III. INTERPRETATION OF RESULTS.

The patients ranged from young adult life to old age, and in the majority of the cases of osteoarthritis they had reached or passed middle age.

The following table gives the average age of the patients at the time of operation, duration of the disease, and age of onset.

Case No. Patients	Diagnosis	Age at Operation	Duration of Disease	Age at Onset
26	Osteoarthritis	43½ yrs.	5 yrs.	38½ yrs.
23	Hypertrophic arthritis. (Exclude Cases 7, 9, and 11.)	45½ yrs.	5 yrs.	40½ yrs.
10	Tuberculosis	27½ yrs.	12½ yrs.	15 yrs.
8	T. B. of childhood and young adults. (Exclude Cases 28 and 35.)	23½ yrs.	11½ yrs.	9 yrs.
3	Congenital dislocation.	13 yrs.	9 yrs.	4 yrs.

Indications for Operation. All the cases operated upon had a decided degree of disability, due either to repeated attacks of the difficulty or to constant pain, progressive stiffness, or deformity of the hip joint. All the cases except six (Nos. 7, 8, 11, 19, 25, and 27) suffered from pain and stiffness, and these six cases requested operation for the correction of deformity or the reduction of dislocation. There were six cases for the correction of deformity, of which four were cases of osteoarthritis and two were cases of tuberculosis. There was one case of reduction of dislocation for neglected congenital dislocation of the hip. Among the cases in which there was practically no pain, Case 7 represented an osteoarthritis, in which the acute symptoms had subsided, Case 33 a congenital dislocation, and Cases 22 and 25 were tuberculosis, with some progression of the disease, but with no complaint of pain at the time of the operation.

The operation was performed in both monarticular and polyarticular cases. Among the cases of osteoarthritis, there were 16 monarticular and 10 polyarticular; among the tuberculous cases, 8 monarticular and 2 polyarticular.

In respect to a history of trauma, this was noted in three cases of monarticular hypertrophic arthritis (Cases 7, 14, and 16), in three cases of polyarticular hypertrophic arthritis (Cases 3, 13, and 17), in two cases of monarticular tuberculosis in elderly men (Cases 28 and 35), and in one case of polyarticular tuberculosis (Case 22).

In the polyarticular cases various joints were involved. In undertaking any operative procedure it was always necessary to consider the possible involvement of the other joints,—hips, knees, ankles, and spine,—on account of their relation to the function of the joint after operation. In the cases of hypertrophic arthritis, Nos. 3, 5, 13, 36 and 37 were associated with some trouble in the other hip; Cases 1, 2, 6, and 17 were associated, respectively, with involvement of the ankle on the other side, with the knee on the other side, with both knees, and with the knee on the affected side. Cases 13 and 21 had some spinal involvement. Case 22 (tuberculosis) had involvement of the knee on the unaffected side, and Case 24 (tuberculosis) had involvement of the knee on the affected side.

At the time of operation the function of these associated joints was not particularly disturbed, except in Cases 5 and 22, although limitation of motion existed in almost all of the cases, and some of the cases had crepitus, without pain. In Case 5, for which an arthrodesis was performed, the motion of the other hip joint was moderately limited, and seven months after the operation an arthrotomy was required for the relief of this. An ankylosed knee on the unaffected side of Case 22 was not considered a contraindication to arthrodesis of the hip.

Evidence of the pathology of the joints was obtained by radiographs and the operative findings. In the cases of osteoarthritis, more or less destruction of the cartilage and bone, overgrowths in the form of exostoses, lipping of the acetabular rim, or diffuse covering of the head and neck were found in almost all of the cases, placing them clinically in the so-called hypertrophic arthritic class. Case 11 (an old infectious process) showed unusual destruction, with the absence of the head of the femur, and posterior-superior dislocation. In Case 5, in which a fracture of the neck of the femur occurred in flexing the thigh at operation, the bone was very spongy and friable. This bony change is noteworthy, although it occurred in only one case. The change in the shape of the head, "mushrooming," and in the neck, "coxa vara," appeared in a few cases, and there were three cases of bony ankylosis.

Capsular thickening appeared in Cases 3, 6, 7, 10, 18, 36, and 38, and capsular adhesion to the neck in Cases 2, 7, and 21. In the infectious case, No. 9, the capsule was obliterated and the periarticular tissues showed extensive inflammatory changes. Fluid in the joint cavity was found in only one case, No. 3, and the amount was very small.

In the cases of tuberculosis, specific destructive processes of the bone, especially the head of the femur, were present in all the cases, and a few cases showed total absence of the head and pathological involvement of the neck. In all the cases except two (Nos. 24 and 28), the acetabulum was also involved, and in Case 29 the acetabulum was obliterated by the reparative process. The acetabulum in Case 26 was shown in the x-ray to be very shallow. In Cases 22 and 28 there was capsular thickening; in Case 28 capsular adhesion. In Case 30, which was a second operation, the capsule was found to be partly diseased and there was a large pocket of tuberculous material between the layers of the muscles. Case 35 had extensive periarticular induration with many foci of tuberculous pus.

In Case 31, old fracture of the neck, the x-ray showed an inward prominence of the acetabulum, with partial destruction, which increased a little after operation. At operation the neck of the bone was found to be soft and spongy, the capsule thickened and adherent to the neck, and the difficulty, which had existed for seven months, was probably, therefore, due to some inflammatory process such as an osteoarthritis.

Absorption of the femoral head was found in two cases of unilateral congenital dislocation (Nos. 32 and 34). In Case 34 the head of the femur was dislocated above and behind the acetabulum, but in Case 32 the head remained in the acetabulum, which had changed in depth and width, and in both cases there was a small, loose piece of bone detached from the head of the femur, which seemed to be the cause of the trouble. Case 33 was a bilateral dislocation, with more trouble in the left hip than in the right. At operation the capsule was found to be contracted into the form of an hourglass between the acetabulum and the head of the femur, and the head was separated and loose at the epiphyseal line. X-ray of the right hip showed new acetabular formation in good condition above the old acetabulum. Practically, the leg had moderate function.

After Course of Operation. In the 21 cases of osteoarthritis in which an arthrodesis was done, the after-course of the operation was very simple. In regard to the duration of the after-treatment for the operated hips, the time varied from three to twelve months, with six months as an average. (Case 6, three months; Cases 8, 9, 10, 11, and 19, four months; Cases 1, 2, 3, 7, 12, 20, and 21, five months; Case 16, six months; Cases 5 and 13, seven months; Cases 4 and 8, eight months; Cases 14 and 15, ten months; Case 17, twelve months.) In Cases 4 and 9 the wound was purulent. Case 4 healed after eight months, and Case 9 still had a slightly discharging wound at the end of four months, although the hip was solid and without pain.

At the end of treatment there was more or less improvement in all the cases, moderately good or excellent functional results, and pain was present in only two (Cases 15 and 16), the former having slight motion and pain after eight months, continuous fixation in a plaster spica producing no effect, and the latter having pain on weight-bearing and some instability of the hip six months after the operation. Cases 2 and 18 represented a second arthrodesis, pain and slight motion in the hip existing, respectively, five months and seven months after the first operation. In Case 4 the functional result in the hip seemed to be retarded by the fact that the knee on the other side was affected and required treatment for seven months after the trouble in the hip had been eliminated.

Decapitation of the femoral head for osteoarthritis was done in Cases 36, 37, and 38. The results in Case 37 was the same as in an arthrodesis, with solid union of the hip and no pain six months after operation, although the operative wound suppurated for five months. One month after operation some degrees of painless motion were restored in Case 36. Five years ago, excision of the exostosis over the hip on the other side was performed, with the restoration of a great deal of motion, which has been very well maintained since. In Case 38 the wound suppurated, and fifty-eight days after operation the patient died from streptococcus septicemia.

Excision of the overgrowths or arthroplasty was done in Cases 39 and 40. The former, one month after the operation, was able to walk with the aid of a cane and had Zander treatment for a long time, but the final result of the case is unknown. The latter followed the normal course of an arthrodesis, with apparently no motion in the hip after three months, and excellent function four months later.

An arthrotomy was performed in Case 4, followed by the death of the patient from anemia six hours later. This occurred seven months after a very successful arthrodesis of the other hip.

In these 26 cases of osteoarthritis, two had a second arthrodesis, two had operations on both hips, two of the cases of arthrodesis did not have ankylosis of the hip, and two of the cases in which there was no arthrodesis had ankylosis. Arthrodesis was performed twenty-three times in 21 cases, with 19 successful results. Apart from arthrodesis, there were seven operations performed on six cases,—two of the cases with ankylosis of the hip, one of them having an excellent result, two cases in which it is impossible to report the ultimate result, but probably it was without effect, and two cases which died. It can be seen in the light of these figures that the final result of arthrodesis was good, and that the results of the operations for the restoration of motion in the hip varied considerably, with lack of success in the greater number.

End-Results. Of the 9 patients who returned for observation of the end-results of operation on the hip, 7 were of arthrodesis. Examination showed that in 8 of the cases (Nos. 10, 13, 14, 17, 18, 21, 37, and 40) there was solid ankylosis of the hip, with a fairly useful position of the leg. Case 37, excision of the head of the femur, and Case 40, excision of the overgrowths, showed the normal operative course of an arthrodesis. X-rays of five cases (Nos. 10, 17, 18, 21, and 40) showed bony ankylosis, but in the x-ray of Case 37 the bony union was doubtful. Cases 13, 17, 18, and 40 had good health and excellent function of the leg. Cases 14 and 38 were not so active, but this was probably due to the advanced age of the patients. In Case 10 the patient was incapacitated by trouble in the other hip and lower back. Case 21 required continuation of the treatment before the final result could be told with certainty. In Case 16, which had no deformity, there was no pain on walking or motion of the joint. Two months after the operation, 110 degrees of flexion and a few degrees of motion in all directions were possible.

The following table gives details in regard to these nine cases in which the end-results were observed.

Of the eight cases reported above, the only one complaining of any trouble in the ankylosed hip was Case 17, who had occasional pain in the buttock, probably due to a neuralgia unconnected with the process in the hip, because the gluteal muscles showed marked atrophy and the patient was able to walk long distances.

From the observation of the above end-results of an arthrodesis for osteoarthritis, in which a solid serviceable hip was secured for the patient at the end of an average period of seven months, or one month longer than the average period for the whole group of cases, we may suppose that

No. of Case	10	13	14	16	17	18	21	37	40	
	Mos.	Mos.	Mos.	Mos.	Mos.	Mos.	Mos.	Mos.	Mos	Averages
Duration of operative treatment.	4	7	10	6	12	8	5	6	7	7 mos. $^2/_9$
Duration from operation to end result.	53	41	37	35	20	17	–	46	26	2 yrs. 10 mos. $^3/_8$
Duration without treatment.	49	34	27	29	8	9	–	49	19	2 yrs. 2 mos. $^1/_4$

in the other cases in which the patient left the hospital with a solid hip in good position, the functional result was also probably good.

The shortening of the leg in eleven cases of arthrodesis is shown in the following table.

No. of Case	10	11	13	14	16	17	18	19	21	37	40
Inches shortening before operation	0	7	0	0	2⅛	½	0	0	0	0	0
Inches shortening after operation	1¼	2½	¼	0	2	½	0	¾	1	0	0

In Case 11 the shortening was reduced 4½ inches by the operation, due to the change in position, and in Case 16 the result would have been better had the arthrodesis been successful. The shortening resulting from the arthrodesis was very slight or nil if the bone changes in the head and neck, such as destruction or coxa vara, were slight.

The operative after-course in the tuberculous cases was very different, although the operative wound healed normally in all the cases except Case 24, in which there was a small amount of discharge from a point in the scar. In nine of the ten cases arthrodesis was performed, and in the tenth (Case 35) decapitation of the head of the femur. Case 22 had a solid hip four months after operation, and three years and two months later solid ankylosis was observed, but function of the legs was prevented by an ankylosed knee on the other side. In Case 23, which was a second arthrodesis, the hip was ankylosed six months after operation, and one year and nine months later the hip was solid and without pain, and the patient could walk without support. In Case 24, an x-ray taken fifty days after operation showed good bony union. An x-ray taken four months after operation in Case 25 showed good bony ankylosis, and two months later the leg was in good condition. Arthrodesis was unsuccessful in Case 26, and the patient complained of almost continual pain in the hip. In Case 27, two months after the operation, a tenotomy of the adductors was performed because their contraction seemed to cause pain in the hip, and five months later there were a few degrees of motion in the hip, and very little pain. The general condition of the patient, No. 28, was excellent, and although the hip seemed to be firm, the plaster was continued. In Case 29, in which there was painless motion of the hip, fixation in a plaster spica was continued. Case 30 was a second arthrodesis, and one year after the operation the hip was ankylosed in good position. In Case 35, the hip, four months after operation, was in good condition, with very little motion.

End-Results. Of these ten patients, the end-result was observed in six. The position of the legs remained good except in Cases 25 and 35. An excellent functional result was secured in Case 23, but in the interval of two years and one month in which there was no treatment a few degrees of painless motion reappeared. This case was observed four years and four months after operation. Case 25 could walk without any support, but the leg was held in faulty position and there was a slight amount of painless motion in the hip. The x-ray, as compared with one taken a year and a half previously, showed progressive destruction. The case was observed a year and ten months after operation. In Case 26 the patient had motion in the hip, accompanied by some pain, and treatment was continued for a year and eight months after operation. Case 27 went without treatment for two months, but the hip became stiff in good position, with moderate function of the leg. The patient was in good general condition. At the end of seven months after operation the x-ray showed some question as to bony ankylosis. In Case 30, one year and two months after operation, the hip had been solid for two months, but the general condition of the patient was rather poor and she used crutches.

In the above-mentioned five cases, the operative end-results of Cases 23, 27, and 30 were good. In the other four cases, arthrodesis was successful in Case 22 and had held for three years and two months. Cases 23 and 30 were a second arthrodesis, so that in these four cases six operations were performed, with a successful outcome in three.

It is difficult to predict the end-results of Cases 24, 28, and 29, because these cases were under treatment for a period of only two to five months, and it must be borne in mind that the insidiously progressive destruction will take place even after a bony ankylosis, such as occurred in Case 25.

In the case of excision of the head of the femur (Case 35), there were sinuses, a periarticular inflammatory process, and faulty position of the leg, but the general condition of the patient remained good. This result was observed two years and two months after operation, and would seem to be a very unsuccessful outcome, but in this case the disease was allowed to take its natural course on account of the periarticular inflammation and the many foci of pus found at the time of operation. A year and a half after operation a sinus developed, and it was not considered wise to interfere with the natural cure of the disease.

Case 31, old fracture of the neck of the femur, progressed normally after the arthrodesis, and eight months later the hip was solidly ankylosed in good position, with an excellent functional result in the leg. It is now four years and one month since the operation.

For the three cases of old congenital dislocation, arthrodesis was performed in two and arthrotomy in one. Ankylosis resulted in all: in Case 32 after two years, in Case 33 after eleven months, and in Case 34 after three years and five months. In Case 33 some motion reappeared in the hip after a year, and caused trouble in walking. The end-result in Case 32, observed two years and five months after operation, showed the patient with an active leg, although the hip was in rather faulty position. Case 34 probably had a serviceable leg, and in Case 33, if the hip has again grown solid, the result must be good. In these non-tuberculous cases, with one hip free from difficulty, a serviceable leg may be confidently expected.

Faulty position of the leg after ankylosis was found in two cases. Case 19 had a firm hip in 45 degrees of flexion and slight adduction, which was just the same amount of flexion as before operation. In Case 32, the hip was held solid in 55 degrees of flexion and a few degrees of eversion, but this malposition in flexion of the leg was compensated completely by the lordosis of the lumbar region, so that the patient could lie with a straight leg and had no difficulty in walking or sitting down. It is not clear whether the faulty flexion in the first case was as well compensated for, because the patient was not as young, but a letter from him contains the following statement: "In regard to my condition, I would say that my leg on which I had the operation does not bother me, although it is not so strong as before." This patient was 24 years old, and the age of Case 32 was 14 years.

CONCLUSIONS.

In monarticular, non-tubercular cases it is always possible to relieve the disability of the leg by an arthrodesis, which can be repeated, if necessary.

In polyarticular cases, if both hips are involved, the motion in one of the hips must be restored by some such operation as decapitation of the head of the femur.

In cases of tuberculosis definite relief cannot be expected to the same degree as in osteoarthritis, but the operation has produced no bad effect on the general or local condition, and has given marked benefit in the majority of the cases.

Arthrodesis has appeared to be especially beneficial in cases which have arrived at a stage of disability where the patient is demanding a more serviceable leg. The leg will be stronger and less troublesome after the operation, and hence arthrodesis is the operation of choice in cases where only one hip is involved. If an operation is required to restore motion in a joint, careful judgment must be used. In Case 16, in which the osteoarthritic affection was supposed to have subsided, it was thought that motion could be restored to the joint by a total excision of the head of the femur. If partial excision were the method chosen, it would be necessary to apply some protection against bony and capsular adhesions, and for this purpose the best material is furnished by free flaps of the deep fascia of the thigh, according to Dr. M. Sumita of Fukuoka, Japan, who in the year 1915 reported over eighty excellent results of various joints. This method will be successful if the refreshed bone surfaces are free from pathological processes.

To Dr. E. G. Brackett, of the Massachusetts General Hospital, in whose Orthopedic Department this work was carried out, I am grateful for much assistance and friendly courtesy. The kindness of Dr. Z. B. Adams in advising me about the observation of the cases is gladly acknowledged.

REFERENCES.

[1] Merrins: Medical News, Jan. 23, 1904.
[2] Fayerweather: Amer. Jour. of the Medical Sciences, December, 1905.
[3] Nathan: Amer. Jour. of the Medical Sciences, December, 1906.
[4] Nichols and Richardson: Journal of Medical Research, September, 1909.
[5] Rovsing: Annals of Surgery, December, 1909.
[6] Brackett: Boston Med. and Surg. Jour., Feb. 15, 1912.
[7] Ely: Amer. Jour. of Surgery, January, 1912.
[8] Brackett: Amer. Jour. of Orthopedic Surgery, July, 1915.
[9] Brackett and Marshall: Boston Med. and Surg. Jour., Nov. 4, 1915.
[10] Sumita: Jour. of Surgical Congress of Japan, April, 1915.

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OBSERVATIONS ON THE TREATMENT OF MYELOCYTIC LEUKEMIA BY RADIUM.*

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Renon, Degrais and their associates (1910) were the first to treat myelocytic leukemia by means of radium exposures over the enlarged spleen. In 1913 they reported five cases. In the first case satisfactory remissions were obtained with five series of exposures over a period of two years. Death occurred two years and two months after the first treatment. In the case of their second patient, a satisfactory result was obtained over a period of nine months with two series of exposures. Death occurred twelve months after the first treatment. Two patients were in good condition six months after their first treatment. The fifth patient had been splenectomized prior to the use of radium, a 2800 gm. spleen having been removed. Following the splenectomy, the leukocytes fell to 27,000, but subsequently rose to 143,000. Benzol was used without apparent effect. The asplenic area was then exposed to radium, and this procedure was curiously followed by a reduction of the leukocytes to 21,500. It was not noted by the authors that the reduction may have been a late effect of benzol; it may, on the other hand, have been due to the direct effect of radium on the large amount of blood in the abdominal cavity. Radium was next applied over the thighs, but the leukocytes rose to 81,600. Radium had been applied over the thighs in one other case of this series without favorable result.

Renon and Degrais mentioned that twelve patients had been treated by other French observers with the initiation of favorable remissions.

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* Presented before the Association of American Physicians, Atlantic City, May 8, 1917.

In the English literature a few cases have been reported in which radium exposures were followed by remissions. Similar results have been obtained by Peabody and by Burnham in this country in a large series of unpublished cases.

In May, 1916, before the Association of American Physicians, Ordway presented a complete and instructive discussion concerning radium therapy in myelocytic leukemia, and placed on record a detailed study of one of his cases in which a remarkable remission had been brought about by means of radium emanations. In this case the patient had been formerly resistant to both the roentgen ray and benzol. Death occurred, however, fifteen months after the recognition of the disease.

The results of these various observers lead only to the conclusion that it is important to make use of this method of treatment, when possible, in order to initiate a remission in a disease with so unfavorable a prognosis. Our own experience from May 15, 1916, to April 1, 1917, comprises a series of thirty consecutive cases of myelocytic leukemia which have been treated by means of the surface application of radium element over the spleen.

Method of Application. In some instances in this series we used 50 mg., and in others 100 mg. of the radium element in tubes. The enlarged spleen was mapped out into squares in the manner described by Ordway, and the radium exposed over each area for periods of three or four hours. The total length of time for each series of applications varied from twelve to forty-eight hours; usually, however, the time was from twenty-four to thirty-six hours. Patients remained in bed during exposure. In the early cases the protection consisted only of 2 mm. of lead beneath the radium and 2 mm. of lead over the radium. The radium was held in place by means of adhesive plaster. Superficial burns resulted, but they were never serious and healed without difficulty. As previously pointed out by Ordway, our experiences demonstrated that the skin formerly traumatized by adhesive plaster was especially susceptible to burn. After adding ½ inch of wood beneath the 2 mm. lead screen we obtained results equally satisfactory, with only occasionally a slight burn. The radium may be raised so far from the skin by means of gauze that little result is obtained from the exposures. When a satisfactory response does not occur we reduce the protection, even to the point of burning the patient. Dr. W. J. Tucker, working with me, devised a biscuit-shaped block which has been used routinely for several months. This consists of ½ inch of wood, 2 mm. of lead, ½ inch of wood bored to receive the tubes of radium, and above this 2 mm. of lead and another ½ inch of wood. The block is held in position by means of a simple canvas belt. An endeavor is made to concentrate the fire through the most massive portions of the spleen.

Clinical Experience. For convenience of presentation, our thirty cases have been classified with respect to the size of the spleen at the time of the original examination. The degree of splenic enlargement is denoted by the Scale 1-4. Scale 4 represents a spleen of enormous size, extending beyond the midline and into the right iliac fossa, practically filling the abdomen; Scale 3, a spleen the edge of which extends well to the right of the navel; Scale 2, a spleen extending beyond a point midway between the costal edge and the umbilicus; and Scale 1, a spleen which is easily palpable or which extends only a couple of inches from the costal edge. Spleens having unusual contour or position have been represented by their approximate equivalents in this scale.

TABLE I.

MYELOCYTIC LEUKEMIA—RADIUM TREATMENT.

SPLEEN—SCALE 1. (SLIGHTLY ENLARGED.)

NUMBER	PREVIOUS LEUKOCYTE COUNT	PREVIOUS NEUT. MYELOCYTE PERCENTAGE	SUBSEQUENT LEUKOCYTE COUNT	SUBSEQUENT NEUT. MYELOCYTE PERCENTAGE	REDUCTION IN SIZE OF SPLEEN	TIME BETWEEN COUNTS	MG. HOURS	NUMBER OF TREATMENTS
173,312	12,200	11.0	3,800	1.7	1 to normal	46 days	5,400	4
175,574	97,000	19.0	6,600	1.0	1 to normal	39 days	3,800	2
186,558	207,000	27.7	12,800	8.3	1 to normal	40 days	6,600	5
169,876	96,000	20.7	8,400	2.7	1 to normal	61 days	2,000	2

There were four patients with spleens in the Scale 1 group (small but easily palpable spleens). The spleen was reduced to approximately normal size in these four patients in from thirty-nine to sixty-one days, after from 2000 to 6600 mg. hours of radium given in from two to five series of exposures. The leukocytes in one instance fell from 207,000 to 12,800 in forty days, and in another from 97,000 to 6600 in thirty-nine days. The general condition and the anemia in all these patients were definitely improved.

Table II.

Myelocytic Leukemia– Radium Treatment.

Spleen Scale 2. (Moderately Enlarged.)

Number	Previous Leukocyte Count	Previous Neut. Myelocyte Percentage	Subsequent Leukocyte Count	Subsequent Neut. Myelocyte Percentage	Reduction in Size of Spleen	Time between Counts	Mg. Hours	Number of Treatments
160,937	188,000	28.0	9,400	0	2 to normal	50 days	2,600	2
	107,600	18.7	68,000	18.3	1 to normal	20 days	800	1
159,989	329,000	29.7	7,000	2.3	2 to normal	54 days	4,300	2
	62,000	14.3	15,800	3.3	1 to normal	31 days	4,450	3
181,494	125,600	7.3	3,800	.3	2 to normal	70 days	5,400	5
183,015	229,000	19.0	81,800	11.3	2 to 1	21 days	5,350	4
187,921	8,200	4.7	6,200	1.7	2 to 1	11 days	3,600	2
172,156	389,000	47.0	147,000	33.3	2 to 1+	13 days	2,000	2
	343,000	25.3	42,600	9.3	2 to 1	23 days	7,000	4
173,445	214,000	29.0	22,000	8.0	2 to 1+	48 days	5,400	3

There were 7 patients with spleens in the Scale 2 group (spleens extending nearly or quite to the region and level of the navel). In 3 of the 7 the spleen was reduced to approximately normal size in from fifty to seventy days after from 2600 to 5400 mg. hours of radium, given in from two to five series of exposures. Two of these patients were discharged at the end of fifty and fifty-four days from the time of the first exposures, their leukocyte counts having fallen from 188,000 to 9400 and from 329,000 to 7000. They returned in four months and in two months, respectively, with leukocytic counts of 107,600 and 62,000 and their spleens slightly enlarged. Reduction again occurred to approximately normal size in twenty and thirty-one days, respectively, with, in one instance, one series of exposures, and in the other, three. The patients were in such good general condition that it was thought inadvisable to extend the treatment to the point of reducing the leukocytes to a normal count. As has been stated, 3 of the 7 patients in this group were discharged with approximately normal size spleens. In the remaining 4 the spleens were reduced to Scale 1.

In one case (187921) the diagnosis was somewhat doubtful. The history was satisfactory for myelocytic leukemia, but the leukocyte count was in the neighborhood of 8000 cells, of which 4.7% were myelocytes. It is quite probable, however, that the case will prove itself to be one of myelocytic leukemia.

In another case of this group, one of long standing (172156), the improvement in the general condition was not commensurate with the reduction in the size of the spleen and the leukocyte count.

Table III.

Myelocytic Leukemia—Radium Treatment.

Spleen—Scale 3. (Markedly Enlarged.)

Number	Previous Leukocyte Count	Previous Neut. Myelocyte Percentage	Subsequent Leukocyte Count	Subsequent Neut. Myelocyte Percentage	Reduction in Size of Spleen	Time between Counts	Mg. Hours	Number of Treatments
173,772	360,000	29.3	5,800	.7	3 to 1	69 days	8,000	5
177,183	712,000	39.7	18,200	6.7	3+ to 1	122 days	9,400	6
183,919	24,300	12.7	16,000	20.3	3 to 1	41 days	5,800	5
188,262	222,000	22.3	22,000	9.3	3 to 1	22 days	9,000	3
170,257	389,000	40.3	20,900	21.7	3 to ?	10 days	1,800	1
168,142	88,000	50.7	34,600	27.3	3 to 2	12 days	3,150	2
169,360	142,000	40.3	9,800	9.3	3+ to 2	43 days	3,600	2
173,740	29,000	20.3	15,200	19.3	3+ to 2	7 days	1,400	1
173,747	8,200	15.7	1,600	2.3	3 to 2	98 days	3,400	3
181,399	395,000	32.7	19,000	0	3 to 2	41 days	7,750	8
52,388	258,000	32.7	108,000	27.0	3+ to 3	12 days	4,450	2

There were 11 patients with spleens in the Scale 3 group (very large spleens, extending well beyond the level of the navel). Four of the 11 spleens were reduced to Scale 1, or were easily palpable in from twenty-two to one hundred twenty-two days after from 5800 to 9400 mg. hours in from three to six series of exposures. Six of the 11 spleens were reduced to Scale 2, or extended approximately midway between the costal edge and the navel. In one, there was only a slight reduction. This patient, however, was in very poor physical condition and treatment was not continued.

One patient of Scale 3 group (173747) gave a satisfactory history for leukemia, but the leukocyte count was low—8200 with 15.7% myelocytes. The leukocyte count became reduced, after three series of exposures, to 1600 cells, of which 2.3% were myelocytes; the size of the spleen was little changed. In the series as a whole, an extreme leukopenia, such as occurred in this case, has been guarded against. The patient began to show changes in the mechanism of coagulation, and slight epistaxis occurred. Transfusion was done and he improved immediately. Three months later he had a definite leukocytosis, which further corroborated the diagnosis. Another patient of this group (169360) showed a marked hemorrhagic tendency at the time of the first examination, *i.e.*, epistaxis, hematuria, petechial and purpuric eruptions, and a very toxic condition. After two series of exposures, a total of 3600 mg. hours, over a period of forty-three days, all hemorrhage ceased, the patient's general condition improved remarkably, the leukocytes were reduced from 142,000 to 9800, and the spleen was considerably smaller. It has been repeatedly noted following radium treatment that the hemorrhages cease when the condition of the patient becomes improved. A very rapid improvement and reduction of the leukocyte count occurred in one patient (170257), in whom, after one series of exposures, 1800 mg. hours, the leukocyte count became reduced in ten days from 389,000 to 29,900.

Table IV.

Myelocytic Leukemia—Radium Treatment.

Spleen—Scale 4. (Huge.)

Number	Previous Leukocyte Count	Previous Neut. Myelocyte Percentage	Subsequent Leukocyte Count	Subsequent Neut. Myelocyte Percentage	Reduction in Size of Spleen	Time between Counts	Mg. Hours	Number of Treatments
175,791	918,000	25.7	19,600	13.0	4 to 1	31 days	8,300	5
162,899	280,000	28.0	11,600	0	4 to 2	57 days	5,300	3
178,536	773,000	35.0	25,000	3.7	4 to 1	75 days	7,700	5
180,499	604,000	28.3	5,600	.7	4 to 1	46 days	10,000	6
176,684	215,000	16.3	8,200	4.3	4 to 1	26 days	4,600	3
168,742	16,400	17.0	4,200	4.3	4 to 2	33 days	4,500	1
175,480	470,000	33.3	157,000	10.3	4 to 3	105 days	7,550	7
166,824	644,000	43.0	30,400	34.7	4 to 3	99 days	4,350	3

There were 8 patients with spleens in the Scale 4 group (enormous spleens). The most remarkable results were seen in some of the cases of this group. In 4 of the 8 patients, the spleen became reduced from Scale 4 to Scale 1 in from twenty-six to seventy-five days after from three to six series of exposures, totaling from 4600 to 10,000 mg. hours. In the remaining 4 cases there was a very considerable reduction in the size of the spleen and in the leukocyte count, in spite of the fact that 2 of the patients were *in extremis*, and no results would ordinarily have been expected from treatment. In one instance in this group the leukocyte count was reduced from 918,000 to 19,600 in thirty-one days after five series of exposures. In another instance the leukocyte count was reduced from 773,000 to 25,000 in seventy-five days after five series of exposures. In this latter patient the reduction of the spleen was remarkable.

Another patient of this group (168742) presented a satisfactory history for leukemia, while the leukocyte count was only 16,400, of which 17% were myelocytes. It is apparently not of rare occurrence to observe in myelocytic leukemia a huge spleen without extreme leukocytosis, the case being of more chronic type with longer history; this type of case is apt to show a less marked remission as the result of radium treatment.

It is not possible, without extended discussion, to follow in detail the individual cases of the series; however, the temporary effect of the treatment by radium exposures has been demonstrated. The ultimate results cannot be summarized at this time, but there is no reason to believe that the effect will be other than temporary. In 14 of the 30 cases, after a marked reduction of the size of the spleen had been brought about by means of radium, splenectomy was done without operative mortality. The postoperative course of these cases cannot be satisfactorily discussed at present.

The Differential Count. The reduction, not only of the absolute number, but also of the relative percentage of myelocytes, is most striking after radium treatment. As a less extreme and quite representative example, one instance (168742) may be cited in which the myelocytes fell from 29.7% of 329,000 cells to 2.3% of 7000 cells, or from approximately 98,000 cells to 140 cells. It has always been possible to find myelocytes in the smears, on prolonged search, though they have occasionally been absent on the routine differential count.

The reduction of the number of neutrophilic polynuclears is also striking The relative percentage remains approximately the same before and after treatment. But the reduction of the absolute polynuclear count is very great; for example, in the case previously cited, a reduction from 57% of 329,000 cells to 70.7% of 7000 cells, or from approximately 187,000 cells to 5000 cells.

Although the relative percentage of small lymphocytes increases after the reduction of the leukocyte count, there is, nevertheless, a reduction of the absolute count to approximately one-tenth of the original number of cells. The relative percentage of large mononuclears increases after treatment, but some of these are, without doubt, myeloblasts.

Reactions Following the Use of Radium. The immediate reactions of radium treatment in the series have been infrequent and mild. Large doses have not been used, and in most instances the series of exposures has been of short duration. Only once did vomiting occur, and it was not severe. In 6 instances there was more or less complaint of nausea with weakness; in 2 there was headache, and in 1 there was quite a persistent complaint of backache.

Radium is a powerful element, and it is necessary to study carefully the results of treatment in order to avoid over-exposure and possible harm. Repeated applications of radium once a week for several weeks may initiate a severe anemia with leukopenia. If the red blood cells fall below 2,500,000, transfusion should be considered and radium treatment temporarily discontinued. When there is reduction of the spleen and reduction of the leukocytes, one's enthusiasm may lead to over-application. As a rule, we have been content to have the leukocytes fall to 20,000 or 15,000 cells. With a definite leukopenia, there seems to be much more likelihood of the occurrence of a crisis with severe anemia and hemorrhage. The anemia may then simulate the primary type, with normoblasts and megaloblasts present. We have noted a temporarily increased fragility of the red blood cells shortly after radium exposure. It is also probable that there is a reduction of platelets after excessive radium treatment. We have learned quite definitely the necessity for the timely use of transfusions in connection with radium treatment. In general, as patients with leukemia approach a serious condition, severe anemia develops. If this anemia can be combated by means of transfusion, life may frequently be prolonged.

Improvement in the General Condition. The improvement in the general condition in some instances is nothing short of remarkable, even after one or two series of exposures. The appetite returns, the toxemia becomes ameliorated, and the strength rapidly increases. The improvement in the general condition does not seem to be the result of a rapid improvement of the anemia, but is probably due to a reduction of the toxemia and leukocytosis and an increase of appetite. Very marked improvement of the general condition is frequently seen with only slight improvement of the hemoglobin and red cell count. A gain in weight results, in spite of the rapid reduction in the size of the spleen. A certain degree of improvement occurred in all the 30 patients treated. In 26 there was marked improvement, and in 13 of these, a very remarkable improvement.

Cases in Which the Anemia was Not Improved. There were 5 patients in whom, at one time or another during the course of the radium treatment, a definite improvement in the hemoglobin and in the red blood cells did not occur. Three of the 5 were in extremely bad condition. One was so ill that after one treatment radium was discontinued. Another was a severe bleeder and was very resistant to treatment, although the bleeding finally ceased and general improvement occurred without transfusion. The third responded fairly well to a first series of exposures, but returned in a few weeks with severe anemia and ascites. The remaining 2 of the 5 patients with severe anemia were examples of the results of long-continued exposures. Leukopenia and severe anemia, together with a petechial eruption and epistaxis, developed. Transfusions were resorted to, and the patients are both now in very good general condition.

Hemorrhage. The effect of radium exposures on hemorrhage in myelocytic leukemia is important. It can be definitely stated that hemorrhages have very promptly ceased after improvement has been initiated by means of radium. Fourteen patients gave a previous history of hemorrhage. In many instances bleeding had followed the extraction of a tooth. Epistaxis was a more common form of spontaneous hemorrhage, Purpura, petechiae and melena also occurred. In only two instances did hemorrhage follow radium treatment when it had not occurred previously. In all of the other hemorrhagic cases the hemorrhage ceased after the first, second or third exposures. One patient, who was a very severe bleeder, ceased to bleed after two series of exposures. The two patients who bled only after radium treatment had developed a severe anemia and a leukopenia, and hemorrhages were slight; in one instance epistaxis, and in the other petechiae over the legs. Transfusions were immediately resorted to, with satisfactory results.

SUMMARY.

1. Thirty consecutive cases of myelocytic leukemia were treated by means of the surface application of radium element over the enlarged spleen. A dosage of 50 and 100 mg. was used. The protection finally adopted was 2 mm. of lead and ½ inch of wood. The splenic area was mapped out into squares after the manner described by Ordway, and the radium was applied over each square for from two to four hours, with a total exposure, usually of twenty-four or thirty-six hours. The exposures were repeated every week until a satisfactory remission was obtained.

2. A certain degree of general improvement, together with reduction of the size of the spleen and of the leukocytic count, occurred in every instance, even in the most advanced and toxic cases. Marked temporary improvement occurred in 26 patients, and a remarkable improvement in 13. It is impossible satisfactorily to discuss the subsequent histories of these cases at this time.

3. Hemorrhage ceased as a rule after one or two series of exposures. In two instances, hemorrhage occurred after radium exposures when it had not occurred previous to treatment. In these instances the hemorrhage seemed to be the result of over-exposure; an anemia also developed; both the hemorrhage and the anemia were successfully combated by means of transfusion.

4. In 25 patients there was definite improvement of the anemia concomitant with the improvement of the general condition. The reduction of the number of leukocytes was due chiefly to not only an absolute but also a striking relative fall in the myelocytes; there was a striking fall in the absolute count of polynuclears, while

their relative percentage remained approximately the same. There was also a marked fall in the absolute count of small lymphocytes.

5. Surface exposures of radium over the spleen of myelocytic leukemia usually effect a very rapid reduction of the size of the spleen, a fall of the leukocyte count, improvement in the general condition and, together with transfusion, constitute at present the most effective temporary measure in the treatment of the disease.

REFERENCES.

[1] Murphy, J. B., Means, J. H., and Aub, J. C.: The effect of roentgen ray and radium therapy on the metabolism of a patient with lymphatic leukemia. Arch. Int. Med., 1917, xix, 890-907.

[2] Ordway, T.: Remissions in leukemia produced by radium in cases completely resistant to x-ray and benzol treatment. BOSTON MED. AND SURG. JOUR., 1917, clxxvi, 490-503.

[3] Renon, L., Degrais and Desbouis: Radium thérapie de la leukémie myeloide. Bull. et mem. Soc. med. d. hop. d. Par., 1913, xxxvi, 54-66; 649-651.

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LYMPHOCYTOSIS: A CLINICAL STUDY FROM GROUP DIAGNOSIS.*

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AN increase in the lymphocytes of the blood stream is a sign frequently met in clinical medicine and, in a certain percentage of cases, is not satisfactorily explained. Keeping in mind the warning of Galambos,[1] that the diagnostic value of lymphocytosis should not be too highly regarded, this article will review the subject briefly and give some impressions gained from the data of the Diagnostic Section of St. Luke's Hospital Clinical Club.

The lack of consideration which a lymphocytosis receives at times is, in part, accounted for by the great number of pathologic states in which it is present. Because of this fact, the field of differential diagnosis is considerably widened if one tries to fit this blood-finding into the clinical picture. Ofttimes it is a part of some minor, concomitant disease, and thus its existence is accounted for.

A consideration of lymphocytosis from the viewpoint of group study[2] should yield some interesting information, because this type of clinical investigation is concerned with the unearthing of every pathologic condition which a patient harbors. Under such a system, every abnormal sign finds its place, or the investigation is continued until the clinical picture is clear. In the work of the Diagnostic Section, the occurrence of lymphocytoses which were often difficult to explain has suggested a review of the subject and a summary of those cases which showed this picture.

Upon looking through the literature to ascertain the physiologic and pathologic conditions characterized by an increase of the lymphocytic elements in the blood, it is soon revealed how varied and apparently unrelated these conditions are. It is possible, however, to divide all of them into two groups, according to the mechanism of their production.

One form, which shall be designated as Type I, is a true lymphocytosis marked by hyperplasia of the lymphatic structures of the body, with an actual increase in the total number of large and small lymphocytes.

The other form, to be referred to as Type II, is a pseudo-lymphocytosis, and is produced by a mechanical forcing of the preformed cells into the general circulation from their recesses in the spleen and other lymphatic structures. This is not marked by an actual increase in the total number of mononuclears in the body and is only transient in the greater number of cases.

Before naming the various states accompanied by the blood finding under discussion, mention should be made of the experimental lymphocytosis produced by the injection of such vasoconstrictor substances as adrenalin,[3, 4] muscarin, pilocarpin and barium chloride. Harvey[3] showed that this was purely mechanical and produced by contraction of the arterioles of the spleen, which was actually reduced in size. Thus there is experimental basis for the belief that many lymphocytes are of the Type II described above.

There are four physiologic states marked by a mononucleosis:

1. In infancy and childhood,[5] the spleen, thymus, tonsils and lymphatic structures in general are large and active, with a consequent increase in the lymphocytes even to half of the white cells.[6] Children respond quickly with a rather high lymphocytosis to many infections and abnormal conditions, which in adults are accompanied by little or no change in the blood picture. It is quite likely that to this fact can be attributed many of the lymphocytes which have been observed to occur in measles, scarlet fever, mumps, anterior poliomyelitis, ringworm, and other diseases more prevalent in childhood.

2. Attitude has been shown to be a cause of lymphocytosis by Bar and Engelmann[7] in Germany, and Stains, James and Rosenberg[8] in this country. The mechanism of this increase is most likely that of Type II.

3. The ingestion of fat and carbohydrates seems to call forth lymphocytes. Rous[9] has shown an increased output of mononuclears from the thoracic duct after the administration of glucose, and maintains that the number of hyaline cells in the blood is materially increased through this mechanism. But, as another possible explanation, we have Bergel's[10] demonstration of the chemotaxis which exist between lymphocytes and lipoid substances in the blood.

4. A sudden mononucleosis occurs after exercise, the absolute number even being doubled in some cases.[5] This mechanism is, of course, that of Type II.

The numerous pathologic states characterized by an increase of the hyaline cells can, for the purpose of study, be grouped with considerable advantage.

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The infections form one class which can be subdivided on the basis of lymph gland involvement.

1. Certain cases of tonsillitis and acute adenitis show marked mononucleosis instead of the usual polynuclear increase.[11]
2. Tuberculosis of the lymph glands[12] shows lymphocytic increase in the early stages before widespread destruction occurs, after which lymphopenia often ensues.
3. In syphilis, during the period of lymph gland involvement, a mononucleosis is characteristic, and this is often associated with eosinophilia. Congenital syphilis has been said to cause a similar picture.[13]
4. Lymphocytosis has long been regarded as pathognomonic of pertussis,[14] and has been attributed by Ehrlich to involvement of the peribronchial glands. But Meunier[15] pointed out in 1898 that the increase is greatest during the period of paroxysms, and this has since been substantiated by many writers. This would indicate that it is of Type II rather than Type I.

There are reported in the literature many disease conditions accompanied by an increase of the hyaline cells in conjunction with a leukopenia. But, as mentioned by Catton,[16] nearly every leukopenia is characterized by a relative increase in the lymphocytes—in other words, the decrease is in the polymorphonuclear cells. In this connection, there should be mentioned an essential difference in the mechanism of true lymphocytosis and polymorphonuclear leukocytosis. The former seems to be dependent upon stimulation of lymph glands, while the latter is an expression of chemotaxis.[17] The two, therefore, do not stand in a reciprocal relation. The non-granular cells are more constant in their number and not subject to the sudden and marked variation of the polymorphs. In fact, the lymphocyte seems to be a cell which is more essential for the maintenance of the body functions than the granular cell. The high percentage of nuclear as compared to cytoplasmic material also speaks for its functional capacity and importance. It is easy to understand, therefore, why the lymphocytes are retained and the granular cells sacrificed in the leukopenias, especially those which occur in debilitated states. One patient on the Diagnostic Section, who had starved himself for some time, had only 2200 white cells, and 70% of these were lymphocytes.

The most typical example of lymphocytosis and leukopenia among the infectious diseases is typhoid,[5] in which, during the third to sixth week, the hyaline exceed the granular cells. This so-called "crossing of the leukocytes" is regarded as having considerable prognostic value, for, in unfavorable cases, it does not occur. Glinchikoff[18] found an increase in lymphocytes during vaccination against typhoid.

Tuberculosis, which frequently shows a leukopenia, is nearly always marked by a relative lymphocytosis. Here Bergel's[10] work must be mentioned in which he pointed out the lipolytic action of lymphocytes, and showed that an increase in these cells occurs in those infections whose etiological agent contains lipoid substances, such as the tubercle bacillus with its waxy capsule. This mononucleosis is protective,[19] and its practical application has been observed, for it is well known that tuberculous patients with high lymphocyte counts give the best prognoses.[20]

Nearly all the protozoan diseases, as malaria, filariasis and trypanosomiasis, etc., which have a normal or decreased number of white cells, have been reported as showing lymphocytosis.

Although not proven to be infectious, the so-called primary anemias show a relative lymphocytosis and leukopenia. The blood picture in scurvy and rickets[21] is similar to this, and upon this basis we can account for the lymphocytosis which they are said to show.

In the German literature, frequent mention is made of "post-infectious" lymphocytoses. This is, perhaps, a general phenomenon which, as just noted, is marked in typhoid. It would seem to speak for an important part in anabolism played by these cells with their high percentage of nuclear material.

An increase in lymphocytes has been observed after therapeutic injections of iodine[22] and its derivatives, phosphorus, arsenic, tuberculin[10] and thyroid extract. This has found explanation in Bergel's work upon the relation of lipoids and lymphocytes, the above-named drugs all influencing lipoid metabolism. Alcoholism has been said to produce an increase in lymphocytes, even to 57%.[23]

An increase in the hyaline cells has been noted during radium[5] and x-ray[21] cures. This may be due to lymph gland stimulation.

Protein anaphylaxis is marked by a mononucleosis, but Schleck[24] states that it is difficult to determine whether this is connected with the anaphylaxis, as such, or is a post-toxic lymphocytosis. It is interesting to note that Schilling[21] names sympathetic ophthalmia as marked by this blood picture, which is another evidence that this phenomenon is an anaphylactic one.

Only brief mention need be made of the relation of lymphatic leukemia and status lymphaticus to this subject, the mechanism being clearly that of Type I. The increase in lymphocytes after splenectomy is explained as a compensatory activity of the other lymphatic tissue in the body.

We approach with caution any discussion of the relation of the endocrine glands to this subject. Kocher and his school[25] claim that lymphocytosis occurs as a direct result of thyrotoxicosis and varies with the degree of toxicity. But Falta,[26] Borchard[27] and others have shown that this same blood picture is present in many other ductless gland disturbances. Their claim that a secondary status lymphaticus results in all endocrine gland dysfunctions offers an easy explanation of the lymphocytosis, but clinical evidence does not agree that such a state occurs in all endocrinopathies. Klose[28] maintains that hyperplasia of the thymus results, at least, in thyrotoxicosis, and this produces the mononucleosis. It was noted previously that therapeutic administration of thyroid extract produces a lymphocytic increase. The active principle of this extract is an iodin-containing compound. Iodin and its derivatives produce this same response by their influence in stimulating lipoid antibodies, which Bergel[10] has shown are furnished by the lymphocytes.

It is no stretch of the imagination to conceive of the lymphatic tissue as a part of the endocrine system, and thus regard a mononucleosis as direct evidence of disturbance in some of the ductless glands. Present knowledge of the intricate relations existing between the endocrine glands is not extensive enough to eliminate such a possibility.

Before turning to a discussion of the data, there remains but one more condition worthy of mention, namely, disturbances of the vegetative nervous system, neuroses of the vagus nerve or vagotonia.[5] The association of eosinophilia, also, with this condition, has been mentioned by Eppinger and Hess.[29] The many points of resemblance between vagotonia and some of the endocrinopathies may point to a common etiology for the lymphocytosis observed in both.

The conditions named in the preceding paragraphs by no means include all of the disease states which have been said to show mononucleosis, but an outline has been given into which could be fitted most of the conditions met with. For example, epilepsy produces lymphocytosis which we class as Type II, that is, purely mechanical and a resultant of the violent muscular effort which is accompanied by adrenalin discharge and contraction of the splanchnic vessels.

In view of the many abnormal conditions which are accompanied by lymphocytosis, it is frequently necessary to unearth all of the patient's pathology in order to find the causative agent, for ofttimes this blood-finding bears no relation to the major complaint, but depends upon some minor, concomitant condition. Under such a system as group study, which endeavors to ascertain all of the pathologic conditions which a patient presents, any finding such as a lymphocytosis should be accounted for.

Before considering the data at hand, it is necessary to state the standards used in judging them. It must be determined what constitutes an abnormal increase in the lymphocytes. The normal seems to vary according to geographic location, but, fortunately for this discussion, a normal for this locality has been established by Mehrtens,[20] who studied the blood of 100 normal doctors, medical students, nurses, soldiers and others such as he could obtain. The average percentage of large and small lymphocytes in his series was 37.45. This is somewhat higher than the figures of Johns,[31] Miller,[32] Bunting,[33] and others who have tried to establish normals for their localities. The term "lymphocytosis" is hereby interpreted as meaning 38% or over. Of 300 patients in this series 57, or 19%, showed such a lymphocyte percentage.

The number of diagnoses made upon the 57 cases constituting the series ranged from one to fourteen (with an average of six). A study of these diagnoses showed that the lymphocytosis in 40 cases was accounted for by some one or two of the list of causes just mentioned. This leaves 17 cases in which the finding is unexplained.

Only five of the previously named causes of lymphocytosis were represented in these diagnoses, namely, tuberculosis, syphilis, thyrotoxicosis, primary anemias and childhood. Twelve cases had combinations of two of these conditions. Reference to Table I shows the number of each occurring alone and in combination.

The remaining 17 cases were studied in respect to the diagnoses made in each, with the following result: Twelve of them showed hypertrophied or diseased tonsils, pyorrhea alveolaris, or alveolar abscesses, or combinations of two or all three of these conditions. The details of this are also to be found in Table I, as well as the frequency of these three pathologic states in association with the five conditions named in the preceding paragraph.

Of the five cases in which the mononucleosis was unaccounted for in the diagnoses, one showed general adenopathy and an enlarged spleen, which were recorded as unexplained findings; one other had an enlarged spleen and a spastic colon. Only one diagnosis was made in each of the remaining three cases, and this did not in any instance account for the hyaline cell increase.

An unique method of statistical study is afforded by recording all the pathologic states possible of discovery. For example, if we chose any finding, such as lymphocytosis, and then study all the diagnoses made upon the cases showing this finding, we should ascertain those disease states in which this blood picture most frequently occurs. Also, these diagnoses should have a higher incidence in the group of 57 cases than in the 300 from which this group was selected. Such data is shown in Table II.

The 57 cases were segregated into three groups, on the basis of the total white count. Forty showed a normal count (5000 to 10,000) ten an increase over 10,000 and seven a leukopenia.

A few points brought out by the table are worthy of note: Tuberculosis is a more frequent diagnosis in the groups with a normal white count and leukopenia. A separation of the tuberculous cases into healed and active ones, shows that the former average 45+% lymphocytes, while the latter only 44+%. This difference is more forcibly brought out by the same figures for 99 cases of pulmonary tuberculosis which occurred in the 300 cases. Fifty-seven healed cases averaged 30.78% lymphocytes, while the 42 active ones averaged only 27.81%.

These data also bear witness to the fact that lymphocytosis is higher in healed or favorably progressing cases and, therefore, has prognostic rather than diagnostic value in this disease.

The greater frequency of hypertrophied or diseased tonsils in the 57 cases than among those making up the whole series can safely be taken as an indication that chronic disease of these lymphogenous organs is apt to be accompanied by hyaline cell increase.

Pyorrhea alveolaris and alveolar abscesses likewise have a greater frequency in the 57 cases. It must be borne in mind, however, that these two infections may be the cause of tonsillar activity, which, in turn, is evidenced by an increase in the mononuclear elements in the blood.

These data seem to confute the unqualified statement that syphilis is accompanied by lymphocyte increase. It is noted that the ten cases showing an absolute lymphocytosis include three diagnosed as syphilis. A very interesting fact is brought out in the statement that the three patients with positive Wassermann reactions had an average lymphocyte count of 49%. This recalls Bergel's[10] work, in which he showed that some lipolytic action on the spirochete is necessary before a positive Wassermann reaction can be obtained. The extensive work of Mayer and Gourdy[34] point out definitely the relation existing between early syphilis and lymphocytosis.

The average eosinophilia count in these ten cases is 3.9, while it is only 1.3 for the whole group of 57. This shows the association of eosinophilia with absolute increases in lymphocytes. The association of these two in congenital lues,[13] endocrinopathies,[26] and vagotonic states[29] is an important point in differential diagnosis.

Spastic colon and constipation were two conditions rather more frequent in our series of 57 cases than in the 300. That the term "spastic colon" is entitled to the dignity of a diagnosis is questioned by many; but its association in our series with a lymphocytosis calls for some comment inasmuch as Hoxie[35] has shown that an increase in the mononuclears occurs in what he calls "auto-intoxication due to colonic stasis." Kauffmann,[36] in 1914, reported a lymphocytosis in 90 out of 140 cases of gastro-intestinal disease "combined with more or less numerous signs of vagus- or sympathetic irritation." If colonic spasticity is a manifestation of what Falta[26] calls "vagal neuroses," we have a reason for expecting an accompanying lymphocytosis.

The presence of chronic appendicitis and chronic otitis media in the table is to be noted. Remembering the chronic mouth infections mentioned previously, we are inclined to the belief that chronic infections, other than tuberculosis and syphilis, may be accompanied by a mononuclear increase.

CONCLUSIONS.

1. The lymphocytosis occurring in tuberculosis is more apt to be a relative than an absolute one and is more marked in healed cases.
2. A lymphocytosis in syphilis is less frequent than in tuberculosis, but an absolute lymphocytosis, especially when accompanied also by eosinophilia, is suggestive of luetic infection. Those cases of syphilis which show a lymphocytic increase are most apt to have a positive Wassermann reaction.
3. An absolute increase in lymphocytes is often accompanied by an eosinophilia.
4. Chronic mouth infections, especially when associated with diseased or hypertrophied tonsils, cause an increase in the mononuclear elements of the blood.

Table I.

		With					
	Alone	Tuberculosis	Syphilis	Thyrotoxicosis	Hyper. or Diseased Tonsils	Pyorrhea Alveolaris	Alveolar Abscesses
Tuberculosis	14	—	4	5	10	9	10
Syphilis	5	4	–	1	5	7	3
Thyrotoxicosis	5	5	1	–	8	7	6
Primary anemias	2	0	0	0	1	1	0
Childhood	2	0	1	0	2	1	0
Hypertrophied or diseased tonsils	1	10	5	8	—	14	7
Pyorrhea alveolaris ..	1	9	7	7	14	—	13
Alveolar abscesses ...	2	10	3	6	7	13	–

Table I shows the most frequently occurring diagnoses in 57 cases with lymphocyte count of 38% or over. The combinations of any two are also recorded. Nineteen patients had two, and six had three of the conditions named.

Table II.

Number of Cases	Total White Cells per cu. m.m. of Blood	Tuberculosis	Tonsils	Pyorrhea Alveolaris	Alveolar Abscesses	Thyrotoxicosis	Syphilis	Spastic Colon	Chronic Appendicitis	Chronic Otitis Media
300		32.60	27.00	27+	14.00	14—	19.00	14+	5+	5.00
57	(Lymphocytes) 38%	42.00	40.25	40.25	33.25	19.25	17.50	17.50	8.75	8.75
40	5,000 - 10,000	47.50	47.50	45.00	37.50	25.00	17.50	22.50	10.00	12.50
10	Over 10,000	20.00	30.00	30.00	30.00	10.00	30.00	0	10.00	0
7	Under 5,000	43—	14+	28.50	28.50	0	0	14+	0	0

Table II shows the percentage of cases in each group which were diagnosed as having the conditions named. The greater frequency of these conditions among the 57 cases with 38+% lymphocytes is illustrated by the higher percentages in the second row as compared with the first.

REFERENCES.

[1] Galambos: Folia Haemat, 1912, xiii.
[2] Butch: Jour. Amer. Med. Assn., 1916, lxvi, 1692.
[3] Harvey: Jour. of Physiol., London, 1906-07, xxxv, 114.
[4] Frey: Ztschr. f. Gesam. Exp. Med., 1913, ii, 38.
[5] Naegeli, O.: Kraus and Brugsch, "Speziel. Path. u. Therap. d. innere Krankh.," 1915.
[6] Benjamin: Versam. d. Gesellsch. f. Kindslsch., 1908.
[7] Bar and Englemann: Deutsch. Arch. f. Klin. Med., 1913, cxii, 56.
[8] Stains, James and Rosenberg: Arch. Int. Med., 1914, xiv, 376.
[9] Rous: Jour. Exp. Med., 1908, x, 238.
[10] Bergel: Verhandl. d. Deutsch. Kong. f. innere Med., 1913.
[11] Cabot: Amer. Jour. Med. Sci., 1913, clxv, 335.
[12] Becker: Deutsch. Med. Wchnschr., 1901.
[13] Engle, C. S.: Deutsch. Med. Wchnschr., 1906, xxxii, 1165.
[14] Baruch: Arch. Int. Med., 1908.
[15] Meunier: Compt. rend. Soc. de Biol., 1898, iv, 103.
[16] Catton: Cal. State Jour. of Med., 1916, 53, 107, 320.
[17] Ehrlich and Lazarus: Nothnagel's Practice, 1909.
[18] Gluchikoff: Summarized Jour. Amer. Med. Assn., 1916, lxvii, 1261.
[19] Webb and Williams: Nat. Assn. for the Study and Prevention of Tuberculosis, 1909.
[20] Watkins: Jour. Amer. Med. Assn., 1911.
[21] Schilling, V.: "Blutbild u. seiner Klin. Verwert.," Jena, 1912.
[22] Weal: Ztschr. f. Chem. Therap., 1913, i, 412.
[23] Sauer: Deutsch. Ztschr. f. Neur., 1913, xlix, 447.
[24] Schleck: Münch. Med. Wchnschr., 1913, 800.
[25] Pettavel: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1914, xxv, 748.
[26] Falta-Meyers: "The Ductless Glandular Diseases," Philadelphia, 1915.
[27] Borchard: Deutsch. Arch. f. Klin. Med., 1912, cvi, 182.
[28] Klose: Ergeb. der innere Med., 1913, x, 167.
[29] Eppinger and Hess: "Die Vagotonie," Van Noorden's Samml. klin. Abhandl., 9 and 10.
[30] Mehrtens: Arch. Int. Med, 1913, xii, 198.
[31] Johns: New Orleans Med. and Surg. Jour., October, 1914.
[32] Miller:; Bull. Johns Hopkins Hosp., October, 1914.
[33] Dunting: Amer. Jour. Med. Sci., 1911, cxiii, 698.
[34] Mayer and Gourdy: Summarized Jour. Amer. Med. Assn., 1917, lxvii, 668.
[35] Hoxie: Jour. Amer. Med. Assn., 1912, lviii, 1493.
[36] Kauffmann: Jour. Amer. Med. Assn., 1914, lxiii, 1104.

THE VEGETATIVE NERVOUS SYSTEM FROM THE CLINICAL VIEWPOINT.*

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While the territory indicated by our title is very great, our knowledge of it is not, and the portion of our knowledge having sufficiently practical bearing to warrant presentation at the present time is still less. However, when the practical available material is reduced to lowest terms, there yet remains enough to furnish ample for many papers of the length which this can reasonably assume. I shall, accordingly, utilize the scope of the title merely to permit the observation of a few of the more important points now discernible as a result of the studies of numerous physiologists and neurologists. Langley, Jacobsohn, Müller, Sherrington, Hess, Eppinger, and Timme, among others, should be accredited at the outset with having furnished and collected much of the information which has opened the way to us for more intelligent clinical observation. The papers of Hess and Eppinger and of Timme discuss most of the clinical essentials available up to the present. When one's interest in the significance of the vegetative nervous system is fully aroused, certain obscure symptomatic manifestations take on new aspects and—if one may in a general way anticipate conclusions—help to clarify the mechanism of symptomatology and point out certain medical and surgical leads in therapy. Confusion in nomenclature, coupled with seemingly contradictory experimental evidence, has rendered obscure the arrangement and function of the various elements of the vegetative nervous system; but there cannot be the least doubt that this system plays a far-reaching rôle in every conceivable pathological process, as well as being a factor of inestimable importance under normal conditions. Through its activities and the degree of its sensitization to various stimuli, it is essential in determining the functional type of the normal individual.

While it would be out of place here to enter too minutely into a discussion of anatomy, certain outstanding anatomical and physiological essentials must be borne in mind in order to furnish a basis for our discussion.

It is better, as Langley has pointed out, to abandon the term "sympathetic system" in its too general meaning, and to recognize that the true sympathetic is but a subdivision of what is known as the vegetative nervous system which furnishes fibers to smooth muscles throughout the body as, for example, to the intestines, blood vessels, gland ducts, and skin; also to certain cross-striated muscles, such as the heart, the terminal parts of the alimentary canal and the genital apparatus, and also furnishes secretory fibers to glands, in contrast to the sensori-motor nervous system, which supplies voluntary muscles and the special senses.

The vegetative nervous system, according to Langley and others, is divided into:

(*a*) The autonomic system, and,

(*b*) The sympathetic system proper (also called the thoracic autonomic), which arises from the sympathetic cells in the lateral horns of the spinal cord from the first thoracic to the fourth lumbar segment, and whose fibers pass out by the white rami to the gangliated cord on each side of the anterior aspect of the bodies of the vertebrae. By its peripherally connecting fibers it supplies the skin, blood vessels, glands, viscera and internal generative organs.

The autonomic is further subdivided into:

(*a*) The mid-brain autonomic which originates beneath the anterior corpora gemina and supplies (contractor) fibers to the iris and ciliary muscles.

(*b*) The bulbar autonomic, which arises in the region of the fourth ventricle and which, by way of the facial, the nervus intermedius, the vagus and the glossopharyngeus, supplies the vessels and glands of the mouth, pharynx, nose, esophagus, stomach, small intestine, part of the large intestine, the trachea and lungs. It is important to note at this point that the vagus is an important member of the autonomic group, and to remember its wide distribution, as well as the fact that its influence on the gastro-intestinal musculature is contractile.

(*c*) The sacral autonomic which, leaving the spinal cord from the first to the third sacral segments as the pelvic nerves, supplies the descending colon, rectum, anus, bladder, urethra and external genitals. Omitting a description of the course, and finer arrangement of the fibers of

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the vegetative system, one may correlate the above statements thus: The vegetative system is made up of two gangliated cords, one on either side of the vertebral column, consisting of a series of ganglia united by short cords. These two gangliated cords extend from the base of the skull to the coccyx. Superiorly, they connect with plexuses which enter the cranial cavity, while inferiorly they converge on the sacrum and terminate in a connecting loop on the coccyx. Each of the ganglia of each of these cords corresponds to one segment of the spinal cord except in the cervical region where, instead of seven, there are only three ganglia (Timme). All these structures are furnished, directly or indirectly, with connecting fibers supplying the motor or secretory mechanisms previously mentioned. In most instances the ultimate terminus is reached only through other peripherally located ganglia which, with their connecting fibers, compose the visceral plexuses. Ganglia so located are known as prevertebral ganglia, in contradistinction to the vertebral ganglia found in the gangliated cords. The use of the term "sympathetic" is restricted to nerves arising from the gangliated cords, whereas all other vegetative nerves are spoken of as autonomic.

It will be seen from the foregoing that many of the structures innervated by the vegetative system have a double vegetative nerve supply; thus all those supplied by the cranio-bulbar and sacral autonomic are also supplied by the true sympathetic. According to Eppinger and Hess, in every visceral organ the sympathetic and autonomic have antagonistic action. It is doubtful whether this is true regarding the bladder, as in this instance, it would appear that stimulation of either system produces contraction, though the antagonistic action may obtain in relation to sphincter control.

In the case of the salivary glands, stimulation of either the sympathetic or autonomic appears to increase secretion.

As a working hypothesis, it is well to imagine the viscera as, in a sense, suspended between these two antagonistic forces. By assuming this conception it is easy to see how disturbing may be faulty function of one or the other system.

Examples of structures probably having but a single vegetative nerve supply, *i.e.*, from the true sympathetic, are the blood vessels, glands, and smooth muscles of the skin (though the evidence of vaso-dilation of the skin vessels and their susceptibility to pilocarpine in vagotonia raises a question in this instance), blood vessels of the gut, the spleen and the internal generative organs.

Owing to the continuous antagonistic action of the two systems,—autonomic and sympathetic,—neither manifests normally its full function. By the normal state of relative equilibrium between the two is determined the tonus of the various structures involved. If, by reason of increased irritation of either system, a disturbance of equilibrium is produced, so that we get an overtone of one or of the other, the condition known as vagotonia, *i.e.*, overactivity of the autonomic, or sympathicotonia, *i.e.*, overactivity of the true sympathetic, results. Vagotonia is in certain cases so clear-cut that it has been described by some writers as if it were a clinical entity. Whether vagotonia is really an overstimulation of the vagus or autonomic system, or is actually an inhibition of the sympathetic, allowing a relative preponderance of autonomic function, is not entirely clear.

It is not unlikely, inasmuch as we are well aware that either system is readily influenced by psychic influences, that each may have a definite center or both a common controlling center in the central nervous system. It is well known that the true sympathetic depends chiefly for its stimulation and continuity of function on the activity of the adrenals and chromaffine system. The chromaffine cells accompanying, as they do, the sympathetic ganglia, are conveniently located to serve their purpose. It is altogether likely, though not proved, that a hormone also exists in the body which has the specific function of stimulating the autonomic system; theoretically, the absence of this hormone would give rise to symptoms of overactivity of the sympathetic by suspending the antagonistic action of the autonomic. Certain it is, that there is an essential interdependence between the vegetative system and the glands of internal secretion. It is not necessarily true that adrenalin is the only physiological sympathetic stimulant, for numerous organs which are under the combined control of both systems may, themselves, under varying conditions, have a depressing or stimulating influence on one or the other division of the vegetative system; furthermore, several of the endocrine organs may be involved in helping to regulate this complicated mechanism.

Much of the study of the vegetative system has been conducted along pharmacologic lines: for example, we know that the autonomic ends may be stimulated by the cholin group,—cholin, pilocarpin, physostigmine, muscarine,—or paralyzed by drugs of the atropine group; whereas the sympathetic ends react to and are stimulated by the adrenalin group and are paralyzed by no known agent. The autonomic may be centrally excited by picrotoxin and the sympathetic by cocaine, atropine and caffeine, and the latter may be centrally depressed by morphine, chloral, and the antipyretics; centrally, botulismus toxin depresses the vagus. Clinically, a special susceptibility to one or the other of these substances, especially to adrenalin, pilocarpine, or atropine, is of diagnostic aid.

A clear understanding of the physiology of the vegetative system is rendered more difficult owing to the essential irritability which certain of the viscera possess in themselves, *i.e.*, the autonomy of function independent of any known central nervous connection. Thus the mechanism of intestinal motility is regulated not only by the vagus and the true sympathetic, but also by the automatically acting plexi of Auerbach and Meissner, so that certain drugs—such, for example, as ergot—may produce motor effects by direct stimulation of the intestinal musculature.

Brief mention may now be made of the more outstanding features incident to autonomic over-activity, *i.e.*, the condition known as vagotonia. The following should be especially borne in mind: moderate myosis, active salivary secretion, tendency to free perspiration, moist hands and feet; in certain instances skin pigmentation, bradycardia, especially the type changing to tachycardia by the use of atropine; Aschner's phenomenon, which consists in marked slowing of the pulse when pressure is made on the eyeball, a sign common in vagotonia, which may be eliminated by the use of atropine; bronchial asthma, respiratory arrhythmia, increased gastric and intestinal tone, gastric hypersecretion and hyperacidity, low blood pressure, eosinophilia. It is very important to note that in true vagotonics the symptoms are exaggerated by pilocarpine and at least partly relieved by atropine.

The symptoms mentioned will recall to your minds many of the pathologically indefinite cases which usually are classified as psychoneurotics.

In instances of over-activity of the true sympathetic, on the other hand, one expects to encounter some of the following symptoms: mydriasis, exophthalmos, free salivary secretion, low gastric acidity, gastric and intestinal hypomotility, tachycardia, increased blood pressure, gastric atony, dry skin, negative Aschner's phenomenon, negative pilocarpine test, but increased symptoms with administration of adrenalin chloride . In our experience mixed types are much more common than pure types of either group. Inasmuch as it has been regarded that the two symptom groups may occur, as Eppinger and Hess say, as due to "inferior constitutional make-up," one is justified in distinguishing certain not especially abnormal individuals as temperamentally autonomic or sympathotonic. It should be understood that we do not maintain either condition to be a pathological entity, but rather an expression of secondary condition of tonus.

In our recent experience clear evidences of disturbances of the vegetative system have been very frequently seen and have presented themselves in a variety of conditions.

While these disturbances obviously occur in acute diseases, it is the low-grade subacute or chronic process which interests us at the present time. As has been already stated, we encounter more frequently what seems to be a combined disturbance of the autonomic and sympathetic than we do the strictly clear-cut vagotonic or sympathotonic patient—for example, an individual with several vagotonic ear marks not infrequently is observed to have a somewhat accelerated rather than a slow pulse, and somewhat dilated rather than contracted pupils. Taking into consideration such combinations, one may still state that there is in these patients a definite preponderance of symptoms conforming to one type or to the other, as the case may be. Practically all such cases are superficially regarded as "neurasthenic."

It is impossible to classify properly the instances of disturbed vegetative innervation which we have seen, for the distinction is one of symptomatology, in many instances, rather than one which yet permits clear-cut diagnostic limitations. Presupposing, however, that in practically every instance the patient is one of those individuals to whom, owing to a generally asthenic state, the terms, "auto-intoxication," "neurosis," "neurasthenia" and the like have been applied, one encounters, in addition to this general picture, certain definite disturbances of function, such as alteration of blood pressure and pulse rate and quality, hyper- or hypomotility of the gastro-intestinal tract, resulting in marked cases on the one hand, in pylorospasm and persistent spastic constipation, and on the other hand in an atonic condition of the gastric musculature and atonic constipation; a positive Aschner phenomenon, a hyper- or hypogastric secretion, a hyper- or hypogastric acidity, moist hands and feet, moderate exophthalmos, obvious disturbances of skin circulation, evidence of improper endocrine function. In all such instances due consideration must be given the vegetative system.

While recognizing the fact that definite lesions such as gastric ulcer, appendicitis, gall-bladder disease, intra-abdominal adhesions and numerous other pathological processes must, of necessity, produce definite disturbances of the vegetative system in many instances, we may omit them from present consideration as they furnish their own medical or surgical indications in most cases, in part, at least, independently of reference to the vegetative system; though it is our opinion that more thorough study and more carefully considered and applied surgical reconstruction, which aims at correction not of one lesion only, but of all available factors of obvious disturbance, offers a future possibility of relief for at least a portion of these sufferers. The question then arises, what, aside from the more commonly recognized pathological lesions in such cases, is probably responsible for vegetative system disturbances? It would appear that in some instances, not so very common, long-continued nervous fatigue is an element. Postural abnormalities, including the more pronounced cases of visceroptosis, with their attendant mesenteric drag (the parietal mesenteric attachment being a close neighbor of sympathetic ganglia), may explain, in part, at least, certain cases. At all events, there is much in favor of correcting, in as far as possible, the disturbed functions incident to such conditions in atonic individuals by postural methods and proper exercises, together with medicinal measures. Undoubtedly, long-continued psychic disturbances are productive of damage of the types under consideration, and in such cases one must recognize that conditions of psychic origin are entitled to psychic as well as general medical assistance.

Probably the two factors deserving of the greatest emphasis—so far as one can judge from clinical observation and therapeutic and operative results—are obscure infections, and disturbances involving the glands of internal secretion. A considerable number of cases could be cited, illustrative of this contention. We have become thoroughly convinced that in our marked vagotonic cases, if a clear-cut source of infection, as, for example, chronically infected tonsils, peridental abscesses or foci elsewhere can be demonstrated,—other things being equal,—we are much more likely to get ultimate satisfactory results if all these toxic sources are thoroughly cleared up, by operation, if necessary. Not only is one sustained in this view by favorable clinical results not obtained by us formerly in some of the same patients for whose relief we had previously used other recognized methods, but the number of positive blood cultures obtainable in such cases, as well as the recognized effects of such infections on other structures, adds weight to the conviction.

With regard to the endocrine system, which in its relation to the vegetative system would furnish a vast amount of material for discussion, one illustrative condition will have to suffice, namely, hyperthyroidism, which furnishes typical evidence of clear-cut sympathicotonia. Rather than to review the familiar symptoms of hyperthyroidism, I will mention briefly the particularly valuable and applicable recent contribution of Goetsch. I refer to the adrenalin chloride test for the determination of the presence or absence of hyperthyroidism. Supposedly in hyperthyroidism the true sympathetic system is sensitized by the over-abundant thyroid secretion, and as a result of this condition, one may, by the subcutaneous use of small doses of adrenalin chloride in border-line cases, bring out almost immediately the phenomena of hyperthyroidism, with typical changes in the pulse and blood pressure curves and the development of other characteristic manifestations. The reaction is transitory, lasting not over an hour and a half and gradually subsiding. This is not the time for further discussion of the test, as Goetsch's original work has not yet been fully published; but that he has utilized the functional susceptibility of the sympathetic as the basis for a most valuable clinical test is obvious to any one who has had opportunity to try it in several cases of varied degrees of thyroid activity.

It is impossible to enter further into the field of therapy beyond the restatement of the fact that certain substances have a specific influence on the autonomic and sympathetic systems; these substances, in our experience, in most instances ameliorate but do not cure. Organotherapy is of distinct value in a limited number of instances, but the real attack must be directed at the etiology. As these conditions are usually chronic, prompt results do not occur; but when the causal elements can be removed, as is in many instances possible, and when suitable reconstructive measures can be instituted, the results are certainly more promising than formerly.

HEALTH INSURANCE AND THE MEDICAL PROFESSION—FROM THE FINANCIAL AND ADMINISTRATIVE POINT OF VIEW.

By R. M. Bradley, Boston,

Trustee of the Thomas Thompson Foundation.

It is perhaps desirable for a layman, in addressing a professional journal, to attempt to qualify as a witness. For a number of years past I have had charge of a considerable fund very largely directed to the alleviation of sickness and its consequent distress. I have thus had occasion to observe the results of medical work in many hundred individual cases and to study the effect of organized nursing and hospital work established in fields where it had not previously existed. I have, likewise, assisted in two canvasses involving the results of existing medical work. In one of them all the ascertainable cases of sickness were covered in a typical population of about 10,000, partly rural and partly urban, and an effort was made to find out what had happened or had not happened to each of those cases in the way of medical and nursing care. In the second canvass in a leading American city, 2000 maternity cases were similarly canvassed, not in a slum population but in districts occupied by families of well-paid mechanics, and others of like independent circumstances. I have, likewise, had occasion to assist in having examinations made of the physical condition of school children, amounting in all to between two and three thousand.

Throughout this task, the work of the medical profession has been looked at from the outside with a view simply to success obtained, or not obtained, in procuring the application of medical, surgical and nursing skill. The investigations have been lay investigations that have not undertaken to discuss or in any way to decide what should be the approved professional methods. What has been looked into has been whether there has or has not been any service at all approximating in any way to any standard professionally established.

This study has been by one who has the greatest respect and admiration for individuals in the profession, and the highest appreciation of the great advances that have been made in the methods of handling disease and disability—*when it is handled*. It has resulted, however, in an almost overwhelming sense of dismay and despair at the enormous gap that exists between that which it is now possible to do for cases when reached by standard medical and nursing practice, and that which is actually being done, the failure existing, not in the nature of the methods, but in getting them applied.

It has seemed to me, in short, that there cannot be any other field of human effort where such a small percentage is actually accomplished of what is plainly possible and at the same time vitally necessary.

I find that my own experience is merely a small part of what is now being found everywhere by others, and that these conditions have only to be comprehended by the laity, to be found intolerable.

From the growing public consciousness of this state of affairs, there has lately arisen a demand for a remedy, taking the shape of a call for state-regulated health insurance, with all that this implies. This movement, which is gathering strength with each year, promises to take away a large part of the control and direction of their own occupation from the most individualistic body of men in what has hitherto been one of the most individualistic of nations. The growing strength of this demand holds out prospects of future working conditions for the physicians that are in many respects most ominous, and yet, as against the conditions that now exist, there is very little that can be held up to the average voter as likely to be more unsatisfactory than what he sees happening all about him. The call for state interference is, therefore, going to prevail unless something better is offered.

In the face of this situation, the medical profession stands apparently helpless, and what little it is doing seems to be chiefly in the line of obstructing or modifying proposed legislation. The better way out seems hardly thought of, namely, how the profession can best keep control and direction of its affairs by accomplishing what the public has the right to demand, the public having no desire to take this work out of the hands of the profession except for the failure to meet its needs.

As an American, I believe that whatever may be the best way for other peoples, our own best hope as a nation of full development and high attainment, in accordance with our genius, lies in retaining personal independence and individual initiative to the fullest degree possible under our complicated civilization. I also believe that, where full individual independence is no longer possible, it is desirable to retain the advantage and the efficiency of private and semi-private combinations of individuals as against an all-absorbing, single-headed, soul-killing state collectivism. I believe that this state collectivism, which to the sociological enthusiast is holding out so many attractive short cuts to immediate accomplishment, is what constitutes the chief menace of our time to true and continued progress. That progress in the end can be based only on the fullest attainable freedom of individual development and accomplishment,—a freedom that does not flourish where government control is all-pervading.

This is the belief, I know, whether formulated or not, of most Americans; but in the face of existing tendencies, it needs to be backed by effective action, and not by the futile defense of individualistic methods that are proved to be no longer adequate. I cannot, therefore, refrain from asking whether it is necessary for the medical profession to contribute, at the cost of its own freedom, to the present tendency towards state collectivism, by ignoring what seems to be the necessary steps towards itself doing the work that the public needs to have done.

The profession has this situation to face. Abundant evidence has been produced to show that, with a very few possible exceptions, wherever the field of its labors is surveyed, conditions like the following are found.

A large proportion of the cases of disease and sickness are untouched by proper care, especially in the incipient stages, where care most often produces results. A large portion of the maternity cases go into the perils of childbirth without the most obvious and rudimentary precautions, and the mothers are obliged, from lack of organized care, to resume their usual occupations so soon after confinement that they suffer the greatest possible amount of permanent injury. A large proportion of the children are left with untreated physical defects that, as a result, must handicap them for life. In general, throughout the field of the physicians' labors the failure to accomplish that which can and should be accomplished is found to an extent that without question is quite intolerable when once recognized.

It cannot be questioned that this condition of affairs exists or that it calls for a remedy. What can be questioned is whether the only possible remedy lies in having the state take charge of the physicians' business. A better remedy lies in the application by the physicians themselves, through the agency of business organization, of certain measures that in any other lines of enterprise would be natural and obvious.

There are two modern elements of accomplishment that seem to be conspicuously absent in the physicians' work as now applied, namely, financing to suit the work and conditions, and the intelligent application of coördinated labor performed.

To begin with the first: Medical and surgical work is largely emergency work in most of its important crises. Severe disease or disability strikes here and there apparently at random, entailing great expenses to one family and leaving another for years comparatively immune.

This evidently calls for the evening-up process of insurance, if the ordinary self-supporting family of moderate means, which makes up the bulk of the population, is to be served. The average family can no more meet and pay for many of the emergencies of sickness out of its current income than it can meet the results of a burned home from the same source. Little or no attempt is made to finance family sickness emergencies except crude and impossible attempts by irresponsible lodge doctors. The result of this state of affairs in the form of deferred operations and treatment, neglected precautions and acute distress, can be seen on all sides.

There are few other forms of enterprise that at the present day would fail, under such circumstances, to bring about the necessary means of financing the delivery of their goods or service.

Supposing that such financing were arranged for in the form of regular payments. Would not there follow, under ordinary circumstances, careful calculations and planning, so that the fulfilling of the contract could be accomplished to the fullest possible satisfaction and at the least cost of labor and materials?

Supposing that a group of responsible medical men should undertake through a business organization to see a group of, say, a thousand families through a year of their earthly pilgrimage, and should plan it out with some of the same care and foresight as is furnished by, say, Raymond and Whitcomb for a European or Oriental trip. A little of what the organization would do is sometimes provided for paupers in a well-organized dispensary, but not for policemen, clerks and letter-carriers and their families, who reach the organized service of the dispensary only after they have suffered the consequences of what is not done and have become, as a result, members of the order of down-and-out. Prevention and early treatment would come first. There would be well-organized examinations so that existing conditions could be ascertained with the least labor cost. Correction and precautionary advice would follow, so that as much as possible of the usual emergency work during the year would be prevented.

It would be dangerous for a layman to go on with the specifications of how the best service could be rendered at the least cost to the contracting parties. What is entirely certain is that those served could afford to pay more for better results, and those better results could, by intelligent coöperation and arrangement, be produced at very much less cost.

It will probably be claimed that the organizing and financing of such service by voluntary association is not practicable, and it can be answered that there is very little market for goods that are never offered. It can also be said that, if the public discovers that these goods are a necessity, some cheap and inadequate substitute for the thing lacking is fairly sure to get into the market.

That is what is coming in this case. The public has come to see its need of having its sickness emergencies financed by insurance protection and the need of some form of more efficient service that it believes insurance could procure.

A contract something like that outlined above will be furnished under government initiative and regulation, but it will probably be a poor American imitation of England's poor imitation of Germany; out of accord with our own real genius of highest accomplishment.

Therefore, instead of the highest standards of service that might be worked out by voluntary business organization, we are likely to get something vastly inferior; and the loss and suffering resulting will be infinite.

The above will probably serve chiefly to relieve the mercenary mind of a layman. It is to be feared that anything that may be said in this line will get little attention from the profession, for the physician is the last man to take his own medicine. He will say with all sincerity and emphasis that the layman who tries to be his own physician is a fool; and then he will turn about and act on the assumption that there is nothing to be got from the layman in the way of administering to the diseases of his own financial and business organization.

The fact remains that, owing to this indifference to the use of modern business methods, the work for which his training and education have equipped him is not being accomplished, and a dissatisfied public is proceeding to put his business into political leading-strings.

Note. Since writing the above, the writer has visited Framingham, Mass., and has found similar specifications being put in practice by Dr. Armstrong in the demonstration that he is conducting there.

GOITER SURGERY, WITH REPORT OF 28 CASES OPERATED UPON, WITH ONE DEATH.*

By Gaston Torrance, M.D., Birmingham, Ala.,

Surgeon to the Birmingham Infirmary.

Most animals are well supplied with thyroid and other ductless glands and are apparently not affected by the removal of large portions of the gland. In growing children it is estimated that one-third of the total thyroid found in the normal person is needed; while only one-sixth of this is necessary in the adult. Some surgeons hold that the total removal of the thyroid is harmless in the adult and should be practised in certain diseased conditions, but Mayo thinks that it should never be done except in malignant conditions. C. H. Mayo says that possibly three of the four parathyroids may be removed without causing any serious symptoms, but advises taking every precaution not to injure them. When one of the parathyroids is found to have been removed, it should be transplanted to some part of the wound, and where the whole gland has to be removed and the patient develops tetany, this can be controlled by the use of lactate of calcium, and at the same time the patient should be given thyroid and parathyroid gland.

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* Read before the Jefferson County Medical Society.

Blair divides goiters clinically into: (1) True exophthalmic; (2) Toxic, simple; (3) Non-toxic, simple; (4) Simple; (5) Inflamed; (6) Malignant.

Goiter—Causes. Rosenow and others have found that bacteria can be cultivated from some of the crushed glands, but the investigations have not been carried far enough to form any definite conclusions. Buford (Goiter in Children) has frequently found diseased tonsils with great cheesy masses and pus in children with enlarged thyroid. He finds that the right lower lobe is more frequently involved in this class of cases and suggests "a differentiation in function of the various areas of the thyroid." This hypertrophy usually subsides when thyroid is given and the source of infection is removed (tonsils, adenoids and teeth). Summers reports that he operated on a mother and three daughters for goiter, and there were other members of the family who had goiter, and there was an ancestral history of goiter. In another family the mother and father had goiter, three infants that died had goiters, and four older living children had goiters and an infant was operated on successfully when eight days old for goiter that threatened asphyxiation.

Exophthalmic—Causes. MacKenzie says in more than one-third of his cases some more or less severe mental shock or strain preceded the onset of the illness, and predicts that many more cases will be found from the effects of the great ordeal the women of England are now going through. He gives the post-mortem results from 36 cases made in St. Thomas' Hospital, in which a persistent, and often much enlarged, thymus gland was found; in seven cases no mention of the gland was made.

Metabolism in Exophthalmic Goiter. An increased basal metabolism was found by Dubois with great regularity in exophthalmic goiter. Thirty-seven observations were made on 11 cases of exophthalmic goiter. The measurement of heat production gives the best index of the severity of the disease and of the effect of treatment. Very severe cases show an increase of 75% or more above the normal average, severe cases 50% or more and moderately severe and mild cases less than 50%, while a few mild and atypical, or those in which operations have been done, may be within normal limits. In severe cases the warmth of the skin and sweating can be accounted for by the necessity for the elimination of heat. Part of the tachycardia may be due to the increased metabolism, and perhaps it might be possible to produce extreme tachycardia, cardiac enlargement, emaciation and mental irritability if it were possible to stimulate the metabolism of normal men 24 hours per day over a period of months or years.

Kendall has succeeded in breaking up the iodin content of the thyroid into two groups. About one-half the total iodin in the thyroid proteins appears in Group B. No crystals have been found in this group, and only very slight physiological action is produced by its administration.

Group A.—A pure crystalline form has been isolated, which has a constant iodin content of 60%. When given to a normal person the so-called hyperthyroid symptoms are produced: increased pulse rate, tachycardia, increase of nitrogen elimination, loss of weight, increase of nervous irritability.

Small doses, 1/180 gr. per day, when administered to cretins, has made a marked change for the better in even a few days.

Pathological Changes in Exophthalmic Goiter.—Wilson says marked evidence of weakness of the quadriceps muscle is noticed in the patient's going upstairs; in the intercostals and diaphragm as shown by the shallow, hurried respirations. He suggests that the relaxed condition of the muscles of the eye may be partly responsible for the exophthalmos. Tachycardia and cardiac dilatation have long been recognized as cardinal symptoms.

In 100 autopsies made at the Mayo Clinic gross or microscopic heart lesions were found in practically every one. The chief histological changes shown in the myocardium are an extensive fatty degeneration of the fibers. In the more advanced cases, fatty deposits are found in large amounts, more or less filling the whole muscle fibers.

Wilson and Durante have examined the sympathetic ganglia removed from 16 cases of goiter, and the changes were found to be most marked in those cases whose symptoms suggested the over-activity of the cervical sympathetic nerves. The changes found were: (*a*) fatty deposits in the ganglion cells, indicating previous degeneration, (*b*) atrophy and reduction in the number of ganglion cells, and (*c*) diffuse fibrosis of the entire ganglion.

Hyperthyroidism and Enlarged Thymus.—A. Kocher says there is always hyperplasia in exophthalmic goiter, but that the thymus is enlarged in only about 45 to 50% of cases, and is more frequently found in young people than in the older cases. He removes a portion of the thyroid and finds that the thymus retrogrades; he does not consider these cases any more serious operative risks. A transitory effect may be gotten by the use of thymus preparations and x-ray just before operation. H. Matti thinks the thymus should be resected before operating on the thyroid.

Blood Pressure in Exophthalmic Goiter.—Taussig says the vascular abnormalities in exophthalmic goiter are analogous to those in aortic regurgitation. The pulse pressure is high as compared to a low or normal diastolic pressure. As in aortic regurgitation, the blood pressure in the thigh is higher than in the arm (20 to 26 mm.). In non-toxic, as in the normal person, the blood pressure in the thigh and arm is the same.

Transplantation Thyroid.—E. Payr has done 7 transplantations in past eight years; the transplanted gland is gradually absorbed, in some cases lasting two and one-half years. T. Kocher has transplanted thyroid in 93 cases and had later reports from 57—18 successful, but continued taking thyroid; 18 failures; 21 successful, with no other treatment. The gland should be living and active or hyperactive, and must be transplanted into vascular tissue, spleen, or bone marrow; he generally transplants to the bone marrow.

Exophthalmic Goiter Treatment.—B. F. Tilton advocates ligating three arteries at one time through a long transverse incision under 1% novocaine, and reports some good results. Mr. Blayney (Royal Academy Medicine in Ireland) advises against operating on cases with sugar in the urine. Max B. Leviton reports two cases that were given 15 or 20 grs. pancreatin two or three times daily by rectum, in which there was complete cessation of the exophthalmic symptoms, with recession of the goiter. These cases occurred in a series of cases of diabetes. Pal's attention was called to this by the antagonistic action on the arteries of pituitary and thyroid extract. He found it has no effect on the normal thyroid, but on the gland functioning to excess there was a pronounced action. The symptoms subside, although the gland may continue to increase in size. He reports 16 cases—in 3 the patients were so debilitated that no operation could be done. Under treatment the improvement was so marked that they were later successfully operated upon. Dowd reports some thyroidectomies done with rectal anesthesia.

Cancer.—L. B. Wilson (Mayo Clinic) stated at a meeting of the Medical Society of Virginia, October, 1916 (*Journal American Medical Association*, December, 1916), that 1 5/10% of simple goiters have been found to be cancerous. Seventy per cent. occur after 40 years and 20% under 20 years of age. One-third of all cases are sarcoma and occur both in the young and the aged, one-half carcinoma. The initial symptom is not pain, but pressure from formation of fibrous tissue. Out of 82 patients, only 25 are alive after three years. He advocates surgery or radiotherapy.

Deaths Exophthalmic.—Dr. MacKenzie, of London (*London Lancet*, Nov. 2, 1916), says: During the four years, 1911-14, the number of deaths from exophthalmic goiter in England and Wales was 1558 females and 155 males—10 females to one male. An analysis of the ages shows that the death rate gradually rises from 10 to 35 or 40, and then goes down gradually until 80 or 85 years are reached.

Operative Results.—Judd and Pemberton report (1916) 121 cases operated in 1909. Group 1—55, or 45.4%, were cured. Group 2—22 cases (18.1%) were practically cured, but had slight symptoms when under great strain. Group 3—7 cases very much improved, but had some nervousness and exophthalmos. Group 4—5 cases slightly improved. Group 5—8 cases derived little or no benefit from the operation.

Starck reports 450 cases of exophthalmic goiter under his care in past few years in which 69 were operated. Cures in 30%, but 35 to 40% were more or less benefited. Mortality, 9%.

28 CASES; 1 DEATH.

Large cystic	10
Exophthalmic	10
Single large cyst	1
Calcified	1
Adenoma	3
Substernal	3
	28

I have operated on 28 cases with one death, which occurred in a secondary operation on a severe exophthalmic case. Ten of these were very large cystic goiters; 10 were exophthalmic. In one case there was a single large cyst resembling a parovarian cyst when opened. One case had a small calcified growth in the right lobe: there were six adenoma, three of which were substernal and produced very marked symptoms.

BIBLIOGRAPHY.

MacKenzie: London Lancet, Nov. 2, 1916.
Wilson, L. B.: Journal A. M. A., Dec. 9, 1916.
Wilson, L. B.: Bull. 4th Dist. Med. Soc. N. C., December, 1915.
Wilson and Kendall: Amer. Journal. Med. Sc., Vol. cli, No. 79, 1916
Mayo, C. H.: Lancet-Clinic, 1915, cxiv, 649.
Tilton, B. F.: Annals Surgery, 1915, lxi, 500.
Dubois, E. F.: Arch. Int. Med., 1916, xvii, 915.
Buford, C. G.: Surg., Gyn. and Obs., 1915, xx, 35.
Blayney, A.: London Lancet, May 30, 1914.
Blair, V. P.: Journal A. M. A., 1915, lxiv, 1895.
Judd, E. S., and Pemberton, J. D.: Surg., Gyn. and Obs., 1916, xxii, 269.
Payr, E.: Archiv f. klin. Chir., 1914, xvi, 16.
Kocher, T.: Archiv f. klin. Chir., 1914, cv, 832.
Kocher, A.: Archiv f. klin. Chir., 1914, cv, 924.
Matti, H.: Berlin. klin. Wchschr., 1914, li, 1310.
Dowd, C. N.: Med. and Surg. Ref., Roosevelt Hospital, 1915, 41.
Starck, H.: Deutsche Medizinische Wchschr., July 8, 1915, 817.
Summers, J. E.: Annals Ophthalmology, July, 1915, 443.
Taussig, A. E.: Journal A. M. A., June 17, 1916.
Leviton, Max B.: Journal A. M. A., January, 1916, 50.
Pal, J.: Deutsche Medizinische Wchschr., Dec. 23, 1915, 1537.

Clinical Department.

THE MENINGEAL SYNDROME AND OTHER SOURCES OF ERROR IN PYELITIS.

BY HAROLD W. DANA, M.D., BOSTON,

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Two years or more ago I saw a patient in whose condition the presence of a pyelitis was overlooked for several days by the dominance of an apparent cerebrospinal meningitis. Since then I have been searching for similar cases. While it is not probable that the condition is a common one, I think that it would fairly frequently be found if stiffness and rigidity of the neck were to be sought for in every case of pyelitis. In most of the cases in which a pyelitis gave an increased irritability of the spinal cord, there was a simple tenderness with slight or moderate rigidity of the neck; there was, sometimes, however, a more or less definite Kernig's sign. The presence of a Babinski reaction has not been found in the cases here reported. It seems very likely that the neck signs which, in my experience, seem to be rather transient, would be found more often if sought for daily in each patient. In hospital, however, we have not by any means found signs of spinal irritation in every case of pyelitis, even in patients examined daily for such signs.

It is difficult to account for the occurrence of such signs suggesting a meningitis, apparently caused by a pyelitis. Possibly it may be due to a simple reflex; possibly there is some pressure from an infected kidney upon the spinal column which makes the spinal cord sensitive to stretching; more likely, perhaps, there may be a more or less marked extension of the disease process to the peri-renal structures, with a slight or even fairly marked inflammation of the meninges.

On the other hand, how shall one explain a very similar condition, which does not seem to be particularly unusual, namely, the presence of an actual meningitis in lobar pneumonia, and which it seems desirable to treat, as in other cases of meningitis, by the use of repeated lumbar punctures, as recorded recently by Musser and Hufford.[1] Presumably in these pyelitis cases, as in the pneumonia cases, since the cultures from the spinal fluid are ordinarily sterile, we are dealing with a definite serous meningitis. Certainly, if we have a case in which the spinal fluid is expelled under pressure, we must assume a condition of an actual inflammation of some sort in the meninges.

Additional evidence as to the probability of the last hypothesis would seem to be given by the case of the boy mentioned above (Case 1).

This boy, when first seen, had a definite stiffness and some retraction of the neck, with a slight Kernig's sign, a history of headache and backache, a high temperature, the urine showing nothing at the time. He was sent into the hospital, where for several days the diagnosis of meningitis was not disproven. As a matter of fact, whatever may have been the definite etiology of the meningeal condition, it would seem plausible to insist that there was an actual "serous" meningitis, since the cell count made upon the spinal fluid, obtained by lumbar puncture, was very considerably above the normal count of ten to twenty cells per cubic millimeter. It seems strange that a process, the seat of which is probably so low in the spinal canal, should manifest itself chiefly by a stiffness of the neck.

Some of the pyelitis histories are reported in detail, while the others had nothing of interest beyond the presence of meningeal irritation. One case (Case 2) seemed to be of particular interest, in that he entered hospital as an acute abdominal infection, was diagnosed as a perforated gastric or duodenal ulcer, underwent operation for this supposed condition, and in spite of extremely careful examination of all the viscera, no cause for his symptoms was found. When he came under my care he had a definite lobar pneumonia, and we felt that this was the cause of his condition. It is, of course, impossible to demonstrate whether the pneumonia was the primary condition, whether the process in his lungs developed as the result of anesthesia, or whether, as now seems probable, the primary process was the pyelitis which later made itself manifest, and which had led both the surgeon and the medical man astray.

It has seemed to me that pyelitis was a difficult condition to diagnose in any case; that a good many cases of this disease go unrecognized, and that when we meet a sudden or an intercurrent febrile condition, with the signs of a severe infection, we ought to bear this possibility in mind more frequently than I, for one, have been in the habit of doing in the past.

If any proof were required as to the difficulty in some cases of making a diagnosis of pyelitis, Case 2, just referred to, is surely to the point. This patient was diagnosed by his first medical attendant as an acute abdominal case, and by him sent to the Carney Hospital. Here, failing of finding accommodation, from lack of beds, he was considered to be suffering from acute intestinal obstruction, and sent to the City Hospital, passing under the care of a clever surgeon before he came to me, and yet we, each and all of us, failed to recognize the patient's primary condition until the day before he insisted on leaving the hospital. In this connection, I may mention that this patient did not have pus in his urine at every examination, nor was albumin reported present in each specimen. In such cases, a daily examination of the urine would enable us to avoid many errors. Why does a particular patient excrete different amounts of pus at different times? Has this absence of pus excretion at any given time any relationship to the occurrence of a chill? As I think of cases in the past, having high fever of sudden onset, accompanied by a chill, no cause for which was ever found, I am strongly led to believe that some, if not all, of these represent other failures on my part to diagnose the presence of a pyelitis, and I suspect that the sudden flare-up in symptoms might have been due to a pocketing or obstruction to the escape from the kidney of this pus. The case histories follow.

CASE 1. D. D., Italian boy, 10 years. Sept. 22, 1913. Seen in consultation with Dr. John T. Williams on Sept. 23. Yesterday patient complained of headache, vomiting, smarting micturition, onset sudden. Temperature 103, pulse 126. General physical examination negative except for a few râles scattered over both lungs. Urine shows nothing abnormal. *Sept.* 23. Nothing remarkable in physical examination, except for considerable stiffness of the neck, slight double Kernig sign, and slight Babinski reflex on the right. Patient sent to the Boston City Hospital with the diagnosis of probable cerebrospinal meningitis. The following is from the hospital records:

Family History.—Father, mother, one brother and one sister living and well. No tuberculosis in family. *Past History.*—Measles. Run over by a wagon, fracturing no bones, four years ago. *Present Illness.*—Duration, 40 hours. Onset was preceded by a cold lasting two days. Onset with vomiting. Later complained of much pain in left lower quadrant, somewhat relieved by movement of bowels. Then began to have severe headache, followed by pain and rigidity of back of neck. Pain in abdomen prevented sleep last night. Anorexia. Constipation. Micturition not at all day before yesterday, now two or three times in day, not at night. No convulsions. One week ago patient had headache and stiffness of back of neck. *Physical Examination.*—Well developed and nourished. Conscious and rational. Considerable prostration. Pupils equal and react to light and distance. Tongue, moderately heavy brownish coat. Throat not red or swollen. Neck, moderate stiffness. No retraction. Heart, 1.75 cm. to right, 7 cm. to left of median line. Action regular, rapid, sounds clear, good quality, no murmurs. Pulses equal, regular, good volume and tension. Lungs, good respiration and resonance throughout. A few crackles at bases behind. Abdomen rigid all over. Spasm can be overcome to some extent, especially on right side. Considerable general tenderness, more marked on left. Right flanks slightly dull, but tympanitic elsewhere. Nothing made out on palpation because of spasm. Extremities: knee-jerks present and equal. Slight Kernig on right. No Babinski, no clonus. White blood count, 47,100. Temperature 102.0. Pulse, 128. Respiration, 30.

Sept. 24.—Spinal puncture gave 25 cc. of clear, colorless fluid under moderate pressure. Cell count, 70 per cubic mm., of which 90% are lymphocytes. *Sept.* 27.—Temperature day after admission normal, now elevated again. Patient vomited a good deal first three days, yesterday and today retains food.

White blood count: Sept. 25, 24,700; Sept. 26, 35,600; Sept. 27, 14,000; Sept. 29, 49,500; Oct. 5, 12,800.

Sept. 24.—Urine, red, cloudy, 1018, acid; albumen, a large trace; many leucocytes, few large round cells, red blood corpuscles and coarse brown granular casts. Surgical consultant reports pyelitis or pyelonephrosis. *Sept.* 27.—Blood smear and differential count show nothing. No plasmodia. Patient ran a septic temperature of 98.0 to 100.5 daily for two weeks, then ran a daily average change of a degree for four weeks more (98.0 to 99.0). *Oct.* 1.—Neck still slightly stiff. Belly tender only on deep palpation, more so on left. Urine continues to show large amount of pus daily. *Oct.* 5.—Staphylococcus culture from urine. Patient has occasional vomiting. *Oct.* 9.—Surgeons advise expectant treatment. Abdomen as above, urine unchanged. *Oct.* 13.—Belly still tender at deep palpation. Urine as before. No change until discharge on Nov. 4, when urine still showed a trace of albumin with much pus. General condition good, temperature above 99.0 each afternoon. *Nov.* 14.—Severe attack of pain in abdomen with spasm and tenderness over whole right flank. Operated upon. Operation shows an acute hydro-nephrosis with some pus formation. Pus evacuated. Patient left hospital Dec. 20. In May, 1916, patient had another attack of pain in abdomen, with temperature 103.0 and pus in urine. At present, February, 1917, patient is still having occasional acute attacks of previous condition.

Case 2. T. T., 35, married. Surgical record: Aug. 1, 1915, temperature, 103.6; pulse, 120; respiration, 32. Dictation by operator: "Patient came from Carney Hospital with diagnosis of acute intestinal obstruction. Not admitted there because of no beds. Does not seem to be a case of intestinal obstruction, but is apparently a case of gastric or duodenal ulcer. Man was taken suddenly ill yesterday a.m., while at work, with vomiting and extreme pain. Has not board-like abdomen of perforation, but operation seems indicated. Too high a temperature for such early perforation." (Digest of operation.) No free fluid or fibrin about stomach or duodenum. Stomach and duodenum thoroughly investigated and no sign of perforation found. No ulcer found. Gall-bladder slightly distended, otherwise negative. Kidneys and ureters negative. Intestines negative. Appendix a small fibrous cord. No evidence of acute pancreatitis, liver abscess, typhoid fever, volvulus, or intestinal obstruction.

Temperature normal on seventh day, and up to 103.0 on eighth. *Aug.* 2.—Urine report: normal, acid, 1023; albumen, slight trace; no sugar; much pus; few round cells. *Aug.* 8.—Urine report: normal, acid, 1023; albumen, slight trace; no sugar; no cells found in sediment. Seen by medical consultant on Aug. 8; transferred to medical service Aug. 9.

Family History.—Mother and father, wife and two children, three brothers and two sisters living and well. *Past History.*—No previous illness. Wine, one to two glasses; beer, one to two glasses a day; no whiskey. *Present Illness.*—Ten days ago, while at work, was taken suddenly with pain in abdomen and vomiting. Since operation has been coughing considerably. Has some pain in left chest. *Physical Examination.*—Well developed and nourished. Conscious and rational. Slight cyanosis and dyspnea. Markedly prostrated. Profuse perspiration. Eyes: pupils equal, react to light and distance. Mouth: teeth fair; tongue, thick white coat. Throat: slight general redness, no edema or exudate. Neck: no tenderness or rigidity. Lungs: right back from angle of scapula to the base is dull with bronchial breathing and increased voice and whisper; rare crackling râle. Otherwise, lungs negative. Heart: 3 cm. to right, 10 cm. to left of median line. Regular, rapid, good quality pulses; no murmurs. Abdomen: level, soft, tympanitic. From ensiform to umbilicus is a median fresh incision with stitches still present. No tenderness or masses. Extremities: negative; knee-jerks present. *Aug.* 13.—Stitches removed yesterday, wound clean. Patient had chills while on surgical side and has had one daily on the 9th, 11th, 12th, and 13th. Temperature rising to 104.0 and above with actual rigor. White blood count, 13,000. Smear negative for malaria. Physical examination as before, but right back shows flatness and absent fremitus from a point midway between angle of scapula and base downward. Prostration marked. *Aug.* 14.—Brother insists on taking patient home. Urine: Aug. 9, normal, acid, 1020; albumen, slightest possible trace, no sugar. Few leucocytes, rare coarse granular cast. Aug. 13, normal, acid, 1012, no albumen, no sugar, many pus cells, rare red blood corpuscle.

Case 3. S. A., 23, married. Sept. 12, 1916. *Family History.*—Unimportant. *Past History.*—Measles and pertussis; habits good. *Present Illness.*—Pains over whole body. Admitted as typhoid. For two months patient has felt tired, dragged out, but has worked until five days ago. At this time complained of severe backache and general pains "throughout her bones." Next day had severe frontal headache. Vomited once, a day later. Pain through stomach, worse on eating. Burning and stinging pain on micturition, nocturia. Urine never bloody. Vaginal discharge one year ago, lasting three months. Has lost some weight in past three months. Other symptoms lacking. *Physical Examination.*—Well developed and nourished. No cyanosis or dyspnea. Conscious and rational. Eyes: pupils equal, react to light and distance. Ears and nose negative. Neck: no rigidity, tenderness, or glands. Lungs: vocal fremitus is not increased. Sounds normal except for slight tendency toward bronchial type. Whispered voice normal. No dulness. Heart: 2.5 cm. to right, 11 cm. to left of median line. Apex in fifth space just outside nipple line. Action regular, faint systolic murmur at apex. Abdomen: no spasm, masses, or tenderness. Liver just felt. Spleen not enlarged. No rose spots. Some tenderness in right flank. Extremities: no edema, scars, or swelling. Knee-jerks present and equal. No Babinski or Kernig. At entrance, temperature, 101.0; pulse, 130; respiration, 30. Sept. 13, temperature, 103.0; pulse, 115; respiration, 28. Widal, negative; white blood count, 16,000. *Sept.* 14.—Past two days has had moderate tenderness and some rigidity of neck. Pain in back severe. Several chills, so patient states. Urine shows much pus in catheter specimen. Pyelitis considered probable diagnosis, in which gynecological service concurs. Transferred to Gynecological Service.

Case 4. M. S., married, housewife. *Present Illness.*—One week ago patient had pains in pelvis like labor pains. Passed some blood. Thinks she is five months pregnant. Took medicine to stop the discharge. Next day was fixed up by a midwife. Ever since pain in both inguinal regions and shooting downward and inward. No difficulty with micturition. Last child three years old. No miscarriages. Seven children living and well. One child died at three months; "could not pass water." *Physical Examination.*—Well developed and nourished. Conscious and rational. Head, eyes, nose, ears, mouth, negative. Neck: no rigidity, tenderness or enlarged glands. Heart: sounds not accentuated. No thrill or murmurs. Action regular. Lungs: good resonance and respiration. Abdomen: rounded, tympanitic, no masses or spasm. Tenderness over both costo-vertebral angles. Liver and spleen not felt. Extremities: no edema, no Kernig, knee-jerks increased. *Mar.* 15.—Temperature, pulse and respiration normal. White blood count (March 14) 14,000; hemoglobin, 80. Patient presents the following physical findings: slight rigidity and tenderness of neck, with suggestive double Kernig. Marked costo-vertebral tenderness. Urine, Mar. 15, normal, acid, 1011; albumen, trace; no sugar; pus in sediment. *Mar.* 17.—Normal, acid, 1007; albumen, slightest possible trace; no sugar; pus and squamous cells in sediment. Mar. 19.—Normal, acid, 1009; trace of albumen, no sugar, pus present. *Mar.* 19.—Temperature, pulse and respiration normal. General condition somewhat improved. Costo-vertebral tenderness less marked, but patient's urine shows much pus. Patient went home against advice.

REFERENCES.

[1] Musser, John H., Jr., and Hufford, Henry K. B.: Lumbar Puncture for the Relief of Delirium in Lobar Pneumonia. Jour. A. M. A., Vol. lxviii, No. 17, page 1231, April 28, 1917.

Book Reviews.

Dr. Lyman Spalding, the Originator of the United States Pharmacopoeia. Co-Laborer with Dr. Nathan Smith in the Founding of the Dartmouth Medical School and Its First Chemical Lecturer; President and Professor of Anatomy and Surgery of the College of Physicians and Surgeons of the Western District, at Fairfield, N. Y. By his Grandson, Dr. James Alfred Spalding. Boston: W. M. Leonard, 1916.

The three hundred and eighty pages of this delightful glimpse into the early medical history of New England represent ten years of hard work by a busy practitioner poring through countless old papers that had been preserved in the author's family, and also collateral investigations of the lives of the contemporaries of his grandfather. The book is made up largely of letters written to Lyman Spalding by the eminent physicians of the time, and short biographies of the medical men who are mentioned in the various letters, that are set forth in James Spalding's original and entertaining style, generally from a unique point of view. The letters are reproduced with a great deal of editorial judgment. In spite of the fact that very few of Lyman Spalding's own letters have been handed down, the reader receives a vivid impression both of the personality of this pioneer in the introduction of vaccination, in the teaching of anatomy and surgery, and in the promoting and carrying to a successful issue the project of a national pharmacopoeia, and, as well, a true picture of American medicine as it was practised in the beginning of the nineteenth century.

One must read the book to appreciate its many excellent qualities. The chapters on the public tests of the preventive value of vaccination in 1801 and the final chapter on the origin and prosecution of the pharmacopoeia are perhaps the best. Working in collaboration with

Dr. Waterhouse, Dr. Spalding conducted public tests at Portsmouth in the summer of 1801 to prove the preventive value of vaccination, a year before similar experiments had been begun at Noddle's Island in Boston Harbor, therefore he is entitled to the credit of priority. Spalding got his first idea of a national pharmacopoeia from Dr. Benjamin Smith Barton's "Collections for an Essay towards a Materia Medica for the United States," read before the Philadelphia Medical Society, February 21, 1798. In 1808 Dr. Spalding discussed the pharmacopoeia with Nathan Smith and Alexander Ramsay, and he read the first paper on the subject of a national pharmacopoeia, offering a working basis for its foundation, before the New York County Medical Society January 8, 1817. As a result of this paper, a committee was appointed to advance the project, meetings were held, then a convention with delegates from the different states, Dr. Spalding being the leading spirit; finally the first edition was printed December 15, 1820, less than a year before the untimely demise of its originator.

Dr. Spalding corresponded with many noted friends in the medical profession of this country and Europe and he had a gift at keeping friendships. His grandson has conferred a great benefit on the lovers of medical biography and the profession at large by placing before them in such readable form this valuable account of his life.

Pulmonary Tuberculosis. A Handbook for Students. By EDWARD O. OTIS, M.D. Boston: W. M. Leonard. 1917.

As Dr. Otis says in his preface, this little work is intended primarily for students of the third and fourth years, to use in connection with their clinical work. It is also hoped that the book may not be without value to practitioners who desire to refresh themselves upon this ever-recurring disease.

Dr. Otis is essentially a clinician and one who has spent his whole life in dealing actively with various problems arising from tuberculosis in all classes of society. This book is essentially the life work of a clinician, but of one who has studied and consequently knows history, anatomy and physiology as well as the detail of clinical story of the disease.

The second chapter, on the "History of Tuberculosis," will prove of value to everyone as giving a graphic sketch of development and progress of knowledge concerning tuberculosis. The diagnosis and prognosis are adequately dealt with. The desirability of studying the symptoms of each individual case in order properly to treat the patient and to derive from the clinical symptoms an explanation of the signs found in the chest, is very properly emphasized.

Unlike many treatises, a full half of the book is devoted to questions concerning treatment. Not only the broad, general lines of treatment are mapped out, but the details dealing with individual annoying symptoms are gone into at such length as give the reader an idea of how the author would meet almost all the troublesome symptoms that are likely to be found in dealing with a long series of cases of tuberculosis. The chapter on "Climate," though short, goes into enough detail to point the way for almost any one seeking climatic cures in the United States. The insistence that financial considerations must always enter into the selection of the climate is well emphasized. The question of prophylaxis is treated from both the patient's and the physician's point of view. A final important chapter is added in regard to marriage and all the problems rising therefrom, which cannot fail to interest all physicians who have to deal with family problems.

To emphasize what was said in the beginning, this book will find its place in the hands of those who wish a real practitioner's experience in dealing with tuberculosis.

Modern Medicine and Some Modern Remedies. By THOMAS BODLEY SCOTT. New York: Paul B. Hoeber. 1916.

The title conveys in no sense the character of the book. As a matter of fact, the book is a small one of some 160 pages, and represents random but, nevertheless, interesting notes on disorders of the heart, arteriosclerosis, and bronchitis and asthma, with a chapter entitled "Therapeutic Speculations and Doubts," presumably to cover the second part of the title. Dr. Scott is an English practitioner and evidently an able one, and his views on some of the problems of medicine are interesting.

The Adolescent Period. Its Features and Management. By LOUIS STARR, M.D., LL.D. Philadelphia: P. Blakiston's Son and Company. 1915.

This book is intended as a complementary volume to the monograph on "Hygiene of the Nursery," by the same author. It aims to present, for parents and others responsible for the education of the young, an outline of the physical and psychical changes to be expected during puberty and adolescence, and of methods of management that may be followed to counteract the possible dependent evils. The chapters deal respectively with the phenomena of growth, physical education, the diseases of adolescence, the faults and animal tendencies of adolescents, menstruation and sexual enlightenment. On the whole, the book is sensible and temperate in its statements and in its treatment of the perplexing problems of so-called sex hygiene.

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THE NATURE OF HEREDITY.

While the theories of heredity are undergoing marked changes of late, and the number of conditions or diseases in which there are evidences of distinct hereditary transmission are becoming fewer and fewer, the changes are rather in the nature of heredity than in the actual fact of hereditary transmission. With few exceptions, no diseases or disturbances are transmitted from parent to offspring *in utero*. Yet it is believed that every disease or deficiency existing in the parent stem at the time of conception finds its reflection in the offspring in the form of a hereditary predisposition to such conditions. In all likelihood, the contact with the conditions or with the environment that produced the disease in the parent stem need not be nearly so positive as in those not having this predisposition, in order to effect similar pathological changes in the offspring. Practically speaking, the only disease known to have a definite hereditary transmission *in utero*—and that is the test of real hereditary transmission—is congenital syphilis, and a constitutional disturbance known as hemophilia. In the latter, the bleeding tendency has a distinct scheme of transmission. It passes from affected ancestor through immune female offspring, and then usually affects a male offspring. Even in mental and associated conditions, where the belief in heredity is still very strong, there is little evidence of definite transmission of a condition *in utero*. Of course it is almost axiomatic to say that in every mating no better, or different, species can be produced than the ancestors. A pure idiot could probably produce only a pure idiot. Yet there are a few notable examples in history of marked defectives producing geniuses, and except for the modern belief that geniuses are peculiar, and manifest a definite defective mental constitution, these cases would tend to disprove many of the notions concerning hereditary mental conditions. According to the Mendelian doctrine of heredity, unless both parents are distinctly defective, not all the offspring will share manifestly in the defects of the ancestors. Some assume only the dominant traits, while others only the defective ones. According to Mendel, this occurs in the proportion of three dominant offspring to one defective or recessive one—that is, if there are that many offspring. Otherwise, only the dominant or only the recessive may come into being. Yet either the recessive or the dominant offspring have dormant in them the characteristics of the other elements which may become activated in some future generations and which accounts for the birth of a single defective in an otherwise normal line. This recessive characteristic has never been wiped out, but remains to be the ancestor of a so-called "throw-back." In the same way, the genius of a defective line is the surviving dominant element in an otherwise defective line.

In tuberculosis, for example, the offspring of the tubercular parents may never become tubercular if these offspring happen to be the dominant proportion of this mating. But the offspring who represent the recessive element may develop tuberculosis, not by direct transmission, but rather because their recessive constitutions have a special affinity for tubercle bacilli. Practically, however, the offspring of tubercular parents are liable to tubercular infection in proportion to the time at which they are removed from contact with their tubercular parents and from contact with any environment or condition that would lend itself to tubercular infection. Tubercular children are infected by contact and not by direct transmission *in utero,* the disease perhaps to be dormant till some future time. It seems that the recessive offspring of tubercular ancestors have a sort of anaphylactic sensitiveness to tubercle toxin whenever brought in contact with it. Any heredity that they may have lies only in lowered resistance to this particular infection. In them the reaction is usually rapid and severe. Yet while this sensitization is apparent, it is difficult to say wherein or in which organ this sensitization is transmitted.

In keeping with the marked developments in endocrinology, the question of the influence of the glands of internal secretion has also invaded the field of heredity. It has been advanced that the glands of internal secretion are mainly concerned in meeting the brunt of this defective heredity, in that they are rendered deficient to some extent in the production of the materials necessary to uphold natural immunity and to prevent this sensitization. The rôle of tuberculosis in the so-called Addison's disease is well known. Here the disease is distinctly a tubercular disease of the adrenals. The mental and emotional disposition of tubercular individuals—that is, their peculiar spirit of cheerfulness and hopefulness—savors very much of a gland overactivity somewhere, because of gland deficiency elsewhere. The control of the secretions from the various glands of internal secretion depends upon an antagonistic control of the other glands of the system. The hyperactivity of the reproductive organs in advanced tuberculosis points in the same direction. The relation of gland development to mental development, even aside from that associated with the thyroid, has been much discussed, and it seems that much of the hereditary diatheses must soon be definitely associated with gland conditions. It is for this reason that organotherapy looms so large in conditions associated with heredity, and although organotherapy may seem to be the rankest empiricism, it does appear to be the only rational therapy in a great many conditions of unknown origin.

DO DEMENTIA PRECOX CASES RECOVER?

The general conception of dementia precox in the recent, or Kraepelinian era of psychiatry, was that it was for the most part an irrecoverable disease, but that a few patients did return to some sort of normality. The catatonic form showed the largest percentage of recoveries and the hebephrenic next, while practically none of the paranoid cases got well. But now that many of the leading exponents of psychiatry have entered into the Freudian era, a new conception of the disease has gained ground. The psychoanalytic, or perhaps it would be better to call it the interpretative, school of psychiatry, looks upon dementia precox as a regression of the individual back towards primitive levels—if the regressive process takes him back to an archaic level, that is, to an ontogenetic level analogous to a very low phylogenetic one, the prognosis is poor. Short of that, there is hope for recovery, depending, of course, on the duration and vigor of the regressive tendency, conditioned somewhat by various collateral circumstances, such as physical health, environment, nature of the therapy undertaken, etc.

It all goes back, of course, to an ancient human disorder, the labelling mania: "A new set of tags, and presto! we have a new theory, a new armament of criteria, a new philosophy," says Mencken.*

From the time of Hippocrates, psychiatrists have recompensed themselves for the inadequacy of their actual knowledge of disease of the mind by a wealth of descriptive terminology. This tendency reached its legitimate height with Kraepelin and has been carried to excess by Ziehen. But even Kraepelin, if our memory serves us correctly, has been quoted as saying that a psychiatrist should be satisfied if he could diagnose one-half of all the mental cases he sees.

Kraepelin, by the way, is responsible for the dementia precox group. It has been alleged by the hypercritical that, after diagnosing all the cases he possibly could, he threw the rest together and proclaimed them a disease entity. Thus the conception of dementia precox, as held by Kraepelin and his followers, is sometimes termed, "Kraepelin's waste-basket."

There seems to be a growing tendency nowadays to hesitate to label a case dementia precox unless it shows a definite picture of emotional disharmony, looseness of thought and judgment, failure of attention and retention, and usually hallucinations and silly delusions, together with a tendency to deteriorate. In other words, the old familiar institution-precox is coming in certain quarters to be regarded as the type of the disease. It follows, then, that some cases which exhibit many or all of the symptoms usually regarded as diagnostic of precox, but which run a short course and make a more or less complete recovery, do not fit in with this scheme, and are coming to be called "allied to dementia precox."

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* "The Plague of Books," by H. L. Mencken. *The Smart Set,* June, 1917.

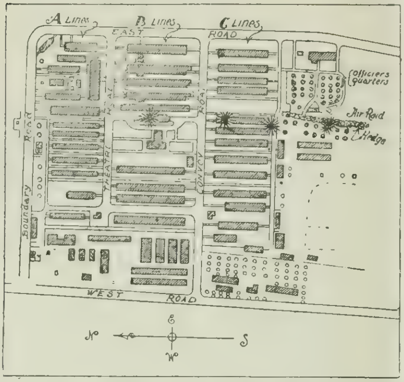
In other words, recovery is being made the diagnostic criterion; and is this not a species of intellectual cowardice? Far be it from us to insist that every case of mental disorder be scrutinized hurriedly, labeled this or that, and thrust into a pigeon-hole; there are many cases which exhibit such anomalous symptoms that it is practically impossible to come to an absolute conclusion as to the group to which they belong. But we do protest against a revision of diagnosis based on recovery alone. Every alienist of any experience at all knows many patients who have at one time exhibited practically all of the typical symptoms of dementia precox—cases which the most fervent psychoanalyst would pass as such—and which have recovered after lengthy detention in a hospital. Indeed, there is one such case in the literature, where recovery was reported after thirty years' residence in the hospital. Let us be frank and above-board in our methods. If we saw a forty-year-old patient who had had a chancre, ten years before, whose blood and spinal fluid gave a complete positive reaction with the Wassermann test, the protein content of whose spinal fluid was increased, who had fifty cells per cubic millimeter of spinal fluid, who showed a Lange colloidal gold curve of 5 5 5 4 4 3 2 1 1 0, and who exhibited all the physical and clinical signs of general paresis, we should not change our diagnosis simply because his symptoms disappeared under treatment. We should call it a remission, and wait for eventualities. But if the case went on five, ten, twenty and thirty years without recurrence we should call it a cure if all the text-books in all the libraries in the land said that general paresis was incurable. So let us exhibit a scientific attitude towards dementia precox. If a case which we have decided, after careful study, is dementia precox, recovers, let us be grateful that the disease is not absolutely hopeless and not take cover behind the dubious shelter of mistaken diagnosis.

AMERICAN MEDICAL CASUALTIES IN FRANCE.

WE have at last begun to receive authentic accounts of the casualties already sustained by American physicians in service in France. Some of the stories narrating these casualties are elaborate in detail, others laconically brief. Among the earliest of the American physicians to be wounded was Dr. Howard F. Keating of Philadelphia, first lieutenant in the United States Medical Corps, who was injured during an air raid on the night of September 24. On October 5, Dr. P. G. Hamlin, first lieutenant of the United States Medical Reserve Corps, and a resident of Richmond, Va., was wounded while engaged with the British forces. And on October 18, Dr. Archibald Graham, first lieutenant of the United States Medical Officers' Reserve Corps, and attached to the British forces, received a severe gunshot wound of both thighs. He was a resident of Paterson, N. J., and had been attached to a base hospital in England.

Dr. Patrick S. Burns of Providence, R. I., has been thrice aboard torpedoed steamers, from which he has each time safely escaped. He was on the *Iberian*, which was sunk in July, 1915; on the *Canadian*, sunk in the spring of 1916; and on the *Devonian*, torpedoed on August 21, 1917, off the north coast of Ireland.

Perhaps the earliest of the casualties in which an American physician was killed was the bombing of the United States Army Base Hospital No. 5, the Brigham Hospital unit, on the night of September 9, 1917. Early accounts of this episode reported the death of First Lieutenant William T. Fitzsimmons, of the United States Medical Reserve Corps, who had joined the unit from Kansas City and was at first unknown in Boston. The description of the attack in which he received his death and in which two others of the unit were killed and twenty wounded, cannot be better told than in the vivid words of a letter from Dr. Harvey Cushing, recently received by Dr. E. H. Bradford, dean of the Harvard Medical School. The accompanying illustration shows the ground floor plan of the hospital and the location in which the bombs struck.



"It was shortly after 11 p.m., and having had a rather strenuous two days, our people were just about turning in, most of the officers were in or about their tents, and the wards for the most part had quieted down for the night. Just where this particular raider had been, or was bound, I do not know, but he evidently was flying in a northerly direction. He had dropped a bomb, luckily in an open place, in the outskirts of one of the hospitals to the south of us; then a torpedo—fortunately a 'dud'—in the hospital adjoining us. A warning had been received, possibly some fifteen minutes before, of his approach; the lights of the camp and district were extinguished, so that by those who were awake it was, of course, known that a raider was in the neighborhood, and the whistle of the torpedo nearby made those who were aware of its significance prostrate themselves. Unhappily, all did not do so, and in a few seconds the next two bombs dropped within ten feet of each other, near the hedge back of the officers' compound.

"Poor Fitzsimmons had been roused, had come to the door of his tent and called to one of the sergeants nearby, as one of the bombs dropped practically at his feet. The poor fellow with his tent was literally blown to pieces, and fortunately could never have known what had occurred. McGuire, another Kansas City man, in the tent next Fitzsimmons, was in his bunk, out of which he was practically blown, receiving only three penetrating wounds—shoulder, arm and thigh—a fortunate escape, for his tent was riddled with holes—someone counted four hundred—and the condition of his possessions can be imagined.

"These bombs were of the 'daisy-cutting' variety, with low-flying fragments which scatter widely, some of the missiles from these first two bombs even reaching and penetrating our wooden mess hut, one hundred and sixty feet away; and some were found in the adjoining hospital the next day.

"Lieut. Rae Whidden, who, though not a member of our original group, has been attached to us for some time, was sitting in his tent, writing, and received a penetrating chest wound; and Lieut. Smith similarly a fragment in the knee-joint. Fitz, fortunately, was away. Morton, who had had a lesson from his experience with us in a more forward area, threw himself out of his tent to the ground when he heard the whistle of the bomb, and escaped with a scratch on his wrist, though fragments went low enough to penetrate his water pitcher standing on the floor. Indeed, every one of the officers had his own little experience, more or less tragic, or—now that some time has elapsed—regarded as more or less amusing.

"The third bomb struck at the end of one of the five-marquee tent wards, in what are called the 'C-Lines,' and the next one directly on one of the marquees of this same ward, fatally wounding an orderly, one of our original enlisted men, named Tugo, the explosion being severe enough to knock down the nurse in charge, Miss Parmelee, who was standing beside him. Fourteen British Tommies were re-wounded in this and in the adjoining ward.

"The fifth and last of the bombs made a direct hit on the reception tent, and it is lucky we were not 'taking in' at the moment, for when a convoy of wounded arrives, this is the most congested spot in the hospital camp, with ambulances, stretcher-bearers, and medical officers in addition to the crowd of walking and lying wounded. Sergeant Edwards and three other men were on duty there. Edwards saw the earlier explosions, shouted a warning, leaped from the chair he was sitting in, and rushed to the end of the tent. Our bugler, Woods, a regular, attached to us at Fort Totten, got up from the floor, thanked him for the seat he had vacated, sat down, and was instantly killed; as was also Rubino, another regular. Two other privates in this group, Mason and McCloud, were badly wounded, and the latter, who happened to be standing, has had to have a double thigh amputation—in fact, three amputations, the last a high one for a severe secondary gas infection. That he is recovering is a great credit to Cutler's skill. Flying fragments from these bombs, as from the first two, spread widely, some of them reaching as far as the little laboratory where Stoddard was intent on his job and didn't budge, not fully realizing what had smashed his sash and broken his window.

"All of this occurred in a few seconds' time, and out of a clear moonlight sky; the kind of a sky a raider chooses, for flying is perfectly safe, and an uncamouflaged hospital must show up plainly on such a night, whether it is lighted or not.

"Then came the work, and then the Unit showed what it was really made of. There were many serious, and some severe wounds, needing immediate attention; and it is bad enough for the staff to have a lot of urgent cases thrust upon them when they receive—as we usually receive—sufficient warning of a convoy. The operations, moreover, had to be carried out by the light of candles and lanterns, for there was no more current that night; and not a few of them were urgent ones for hemorrhage. Everyone, of course, took a hand, and that there was so much to do was probably a blessing, for it certainly must have helped to crowd out all other thoughts.

"There were many instances of presence of mind, of self-sacrifice. It is hardly proper to ask about them or to single them out. I may mention one or two examples that have come to me. Miss Parmelee, who had such a close call, went right to work on the re-wounded in her ward, and found, when she tried to take a patient's pulse, that her watch had been cut away from its strap. In the morning she reported to the operating room to have a small fragment removed from her eyelid; there were about a dozen holes through her jersey and wraps. Mason, one of the men who had been in the reception tent, got to work immediately with the others, carrying wounded, and not until some time after was it noticed that he, too, was wounded; he had, indeed, a penetrating wound of the skull."

Dr. Fitzsimmons, prior to joining Dr. Cushing's unit, had spent a year doing hospital work in France. He was a graduate of the University of Kansas. Dr. Rae Wygant Whidden, of New York City, is well known to many friends in the Boston profession. He graduated from the Harvard Medical School in 1911. Dr. Thaddeus D. Smith is a resident of Neenah, Wisconsin, and Lieutenant Clarence A. Maguire, of Kansas City, Mo. It is an element of melancholy irony that Dr. Fitzsimmons had been recommended for promotion to a captaincy on the very day when he was killed. A bill has been introduced into the National Congress to enter his name on the military records with the promotion he would have received, had he lived. He was the first American officer to give his life in the war.

To Boston physicians the most grievous loss thus far sustained in the war is the death of Dr. George Plummer Howe, first lieutenant in the Medical Officers Reserve Corps, well known and remembered and beloved by many friends in the profession of this city. An account of his life and death was published in the issue of the Journal for October 25, 1917. He was killed in action on September 28, while on duty with the British forces in France, but of the exact circumstances of his death no reliable account has yet been received. Dr. Howe sailed for Europe at the earliest opportunity after the United States entered the war, and narrowly escaped death on the *Mongolian*, the vessel aboard which the fatal shell explosion, killing two nurses, took place shortly after leaving port. Dr. Howe was standing near the gun at the time the explosion occurred. He had been refused by the American Medical Reserve Corps on account of defective eyesight, but obtained a commission in the British army as battalion medical officer in the Tenth Royal Fusiliers.

In another column of the present issue of the Journal is published the memorial notice of Dr. Howe, prepared by his chapter in the Aesculapian Club of Boston, of which he was one of the founders. The gallantry with which Dr. Howe met his end, though as yet unknown, will be taken for granted by all who were acquainted with his brave and stable disposition. To them his living personality, which can never become less vivid with time, is admirably recalled in letters written to friends shortly before his death. Two of these are here published for the first time by courtesy of a Boston physician, to whom they were addressed.

Sept. 16, 1917.

When you gave your dinner to the Dirty Dozen most everybody had something interesting to tell but yours truly. Since that time things have moved with me a bit. I am now battalion medical officer to the 10th Royal Fusiliers, and like the job.

Surgeon to an infantry battalion in war is not my job, medically speaking. While I have learned a lot that I did not know before, none of it is any use from the point of view of civil practice. I really think I am popular with officers and men of my battalion. I am heavyweight wrestling champion, and am not so bad at putting my horse over the jumps. We run a very good mess, and do not let ourselves suffer for thirst. I have not yet been in a big push, but have had a hand in some small trench raid affairs and been shelled a bit. At present we are battalion in support—just far enough back so that there is no excitement and near enough so that I can't have up my horse and go for a ride as something might happen any time.

A damn 12 m. howitzer on my right is firing once every 5 minutes and makes a noise that might bust your eardrums. The Bosche is making for a captive balloon behind us with shrapnel—mostly falling short.

It is a beautiful September afternoon. I expect that the war is good for another year yet, unless it ends in a standoff. If the papers tell you that Fritz is all in, don't believe it. He is having a pretty bad time but still has considerable pep left.

When I was in London early in June I saw Kidner—Jim Graves—Goldthwait and Fred Murphy. In Boulogne I saw Frank Palfrey (damn that 12m howitzer); I can't hear myself think.

When I came out they asked us what work we wanted. I said I wanted a seat in the front row, so I was sent at once to a field ambulance for training. While there I acted as battalion medical officer to the Divisional Engineers, then to the 13th Fusiliers during leaves of their regular officers, then was permanently appointed to the 10th and expect to remain with them to the end of the show. If I don't, it won't be my fault. I have been in fine health all the time except that I have boils whenever we are up front where you can't wash properly. I think my job beats any base hospital game hollow.

Sept. 27, 1917.

It seems likely that we move forward tonight. There is a big attack on, as you doubtless know from the papers. So far we have gained and come out excellently for losses, from all I can hear. Of course if you are not yourself in a show you know very little of what is going on, and even if you are, you only know how it is near you. The difficulty with the new German defense is not to gain ground, but to hold it after you get it, as the Germans hold their front line lightly—have every landmark registered for their batteries and yield easily to the first assault, then pour fire on our infantry and batteries coming up to take position. We shall probably go in as holding troops and will probably get all that is coming to us.

It will be my first chance at a real battle, and I must say I rather look forward to it.

The papers gas a lot about French .75s, but if you want to see real artillery and really first-class artillery work, call on the B. E. F. There never was anything like it before and won't be again very soon. One of the German prisoners remarked that we did not know what it was like to be under real artillery fire, and he was about right, too.

Yours sincerely,

Peter Howe.

In a letter to another Boston physician, now serving in France, the colonel commanding the British field hospital, with which Dr. Howe was stationed for a time before joining the Fusiliers at the front, speaks of him as follows:

"I was very grieved to hear this afternoon that poor Howe was killed yesterday by a shell. Lieut. Howe left us about a month ago, when he took medical charge of a regiment.

I have not yet heard full details of his death, but understand that he was standing talking with about half a dozen others, when a shell fell in their midst, and poor Howe was killed instantaneously.

He was a fine brave fellow, and is a great loss to our Division."

American medical casualties in the war are as yet few, but they have involved already the bravest and best of our colleagues and friends. There will be many more and many, perhaps, less romantic and gallant in circumstance. Those who have been first to go have shown the path of duty, which it may be the occasion for any of us to follow. It is matter for gratitude that the American medical profession, true to its ideals, has shared in the earliest sacrifice of life, as well as of labor, in the service of country and in the cause of mankind.

MEDICAL NOTES.

Alleged Increase of Cancer.—In the *Journal of Cancer Research*, Vol. ii, July, 1917, Walter F. Willcox of Cornell University has written an article challenging the common belief that cancer is on the increase. After quoting exhaustively from statistics, he summarizes his conclusions as follows:

The reported mortality from cancer is increasing in almost every part of the world from which reports exist, but the real mortality, if it is increasing at all, is certainly not increasing with equal rapidity. About one-tenth of the apparent increase, he believes, may be proved as due to changes in sex and age composition. The remaining nine-tenths of the increase are explained by improved diagnosis. To support his belief he puts forward various convincing reasons which must be taken into account in any intelligent and thorough understanding of the cancer situation.

WAR NOTES.

To the Officers of the Medical Reserve Corps, U. S. Army, Inactive List.—Word received from the Surgeon-General of the U. S. Army conveys the information to officers of the Medical Reserve Corps of the United States Army, inactive list, that assignment to active duty may be delayed, and that they are advised to continue their civilian activities, pending receipt of orders. They will be given at least 15 days' notice when services are required.

Promotion of Dr. Hugh Cabot.—It is announced that Dr. Hugh Cabot of British Base

Hospital No. 22 has been made lieutenant colonel of the Royal English Medical Corps. He has succeeded Lieut.-Col. Sir Allan Perry as commanding officer of the Hospital. This is in addition to being chief surgeon, which position he has held for some months. Dr. Fred Jouett of Cambridge will soon sail for France to join the unit.

War Relief Funds.—On Nov. 10 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$293,185.31
Armenian-Syrian Fund	246,376.58
Surgical Dressings Fund	132,834.99
War Dogs' Fund	1,839.25

BOSTON AND MASSACHUSETTS.

Week's Death Rates in Boston.—During the week ending Nov. 10, 1917, the number of deaths reported was 236, against 255 last year, with a rate of 15.93, against 17.49 last year. There were 26 deaths under one year of age, against 34 last year.

The number of cases of principal reportable diseases were: diphtheria, 125; scarlet fever, 32; measles, 47; whooping cough, 26; typhoid fever, 4; tuberculosis, 49.

Included in the above were the following cases of non-residents: diphtheria, 21; scarlet fever, 5; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 5; scarlet fever, 1; measles, 2; whooping cough, 1; typhoid fever, 1; tuberculosis, 23.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 1.

The Framingham Experiment.—The community health experiment at Framingham is to give, the coming winter, under the direction of its executive officer, Dr. Donald B. Armstrong, a series of lectures and clinics for Framingham physicians, to be given by physicians and scientists on special phases of the tuberculosis program. At the same time it is planned to arrange for public meetings on these subjects so that the townspeople may be given the opportunity to hear from these distinguished persons facts and information regarding the care of those matters necessary to the building up of a model health community.

Prevalence of Diphtheria.—Because of the unusual number of cases of diphtheria that have appeared in Boston and the State, the Boston Health Department has sent out a letter to physicians, asking for particular care at this time in the detection of the disease. The letter in substance is as follows:

"Diphtheria is unusually prevalent in Boston, as well as in other parts of the State. Physicians should isolate and take cultures from the *nose* and throat in every suspicious case. Antitoxin should be given at once, without waiting for laboratory findings. A positive laboratory report is conclusive evidence of the presence of diphtheria, but a negative report is never conclusive of the *absence* of diphtheria. There are various factors, as overgrowth of other organisms, etc., that may prevent diphtheria bacilli from being demonstrated in a laboratory examination.

Please advise parents to isolate every child with nasal discharge, sore throat, or indefinite symptoms, as these are often proving to be diphtheria."

An Opening for Physicians.—In a letter addressed to the editor of the *Weekly Bulletin*, Dr. Donald B. Armstrong, executive officer of the Community Health Demonstration, calls attention to three full-time medical positions now open at Framingham, Mass.:

"These include a public school medical supervisorship, a medical position in one of our larger industries, and a medical position at the head of our industrial medical organization for the community as a whole. The first two positions will pay $2500 a year and the third position $3500.

We would, of course, prefer to secure men with school or industrial experience for this work, but owing to the pressure of present conditions it may be necessary to take a young man with sound medical background and have him develop with the work.

I would appreciate very much being placed in touch with any one who may come to your attention. We are very anxious to fill these positions at once; our inability to do so to date is considerably retarding the progress of the Community Demonstration."

The Massachusetts Medical Society.

OFFICERS OF THE MASSACHUSETTS MEDICAL SOCIETY, 1917-18.

President

Samuel B. Woodward 58 Pearl Street, Worcester

Vice-President

George P. Twitchell 17½ Federal Street, Greenfield

Secretary

Walter L. Burrage 282 Newbury Street, Boston

Treasurer

Arthur K. Stone 44 Fairfield Street, Boston

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Edwin H. Brigham, Brookline
8 The Fenway, Boston

Standing Committees.

Of Arrangements

James H. Young, *Chairman*
19 Baldwin Street, Newton

On Publications and Scientific Papers

George B. Shattuck, *Chairman*
183 Beacon, Street, Boston

On Membership and Finance

Charles M. Green, *Chairman*
78 Marlborough Street, Boston

On Ethics and Discipline

J. ARTHUR GAGE, *Chairman* 64 Central Street, Lowell

On Medical Education and Medical Diplomas

HAROLD C. ERNST, *Chairman*
240 Longwood Avenue, Roxbury

On State and National Legislation

SAMUEL B. WOODWARD, *Chairman*
58 Pearl Street, Worcester

On Public Health

ENOS H. BIGELOW, *Chairman*
P. O. Box 213, Framingham

NOTES FROM THE DISTRICT SOCIETIES.

DISTRICT CORRESPONDENTS.

Berkshire, A. P. MERRILL, M.D., Pittsfield.
Bristol North, ARTHUR R. CRANDELL, M.D., Taunton.
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.
Essex North, T. N. STONE, M.D., Haverhill.
Essex South, H. P. BENNETT, M.D., Lynn.
Hampden, LAURENCE D. CHAPIN, M.D., Springfield.
Hampshire, E. E. THOMAS, M.D., Northampton.
Middlesex South, WILLIAM C. HANSON, M.D., Belmont.

SUFFOLK DISTRICT MEDICAL SOCIETY.—A meeting of the Suffolk District Medical Society was held on October 24 at the Boston Medical Library. In spite of the rainy weather, about eighty members were present. The president, Dr. H. F. Vickery, was in the Chair. In addition to the regular business of electing nominating and auditing committees, it was voted that the Chair, in accordance with the request of the Surgeon-General, appoint a committee of ten to ascertain the condition of those disabled persons in Suffolk County who have successfully taken up new occupations, and that this committee be supplied with funds. It was voted also that the Chair appoint a committee to study the problem of caring for the families of medical men in the Service. The names of these committees will be printed in a later issue of the JOURNAL.

Dr. J. Whitridge Williams of Baltimore read a paper on "Repeated Cesarean Section." This was discussed by Drs. Reynolds, Newell, Mason and Konikow.

The meeting was followed by refreshments.

GILBERT SMITH, *Secretary*.

Miscellany.

RESOLUTIONS OF THE CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA.

IN last week's issue of the JOURNAL we commented editorially on the recent session in Chicago of the Clinical Congress of Surgeons in North America. On October 23, prior to this meeting, the following resolutions were adopted unanimously at a meeting of all the state committees (with the exception of Maine and Delaware) of the medical section of the Council of National Defense. These resolutions urge immediate action to provide for at least six months of intensive military training of all young men in their nineteenth year, to become operative as soon as the army cantonments are available. They also recommend physical training in schools.

Whereas, The experience through which the United States is now passing should convince every thoughtful person of the necessity for the universal training of young men, not only for the national defense in case of need, but also to develop the nation's greatest asset—its young manhood—in physical strength, in mental alertness, and in respect for the obligations of citizenship essential in a democracy, therefore be it

Resolved by the State Committees of the Medical Section of the Council of National Defense that they strongly urge the adoption by our government at this time of a comprehensive plan of intensive universal military training of young men for a period of at least six months, upon arriving at the age of nineteen years; and that this body also support the movement to secure the introduction into public schools of adequate physical training and instruction;

Resolved, That the members of each State Committee immediately take active steps to insure public support for the subject of these resolutions through the newspapers, through public meetings and through the appointment of committees in each county; also that copies of these resolutions be forwarded to the senators and members of Congress in their respective states, with a personal request that favorable action be taking at the coming session of Congress upon a measure following the principle of the Chamberlain bill and to become operative as soon as the army cantonments are no longer required for the training of the forces in the present war;

Resolved, That each State Committee from time to time report to the Medical Section of the Council of National Defense as to action taken and progress secured in their several states.

At the session of the Congress on October 25, 1917, the following similar resolutions were adopted:

Whereas, The experiences of the nation convince us of the necessity for universal military training, to furnish qualified men for defense, to strengthen manhood and mental poise, and to make for a more efficient citizenship, and

Whereas, We believe it will democratize youth and furnish discipline while developing physical force and endurance, and will produce better fathers and workers for the ranks of peace.

Therefore, Be it resolved that the Clinical Congress of Surgeons at its eighth annual session urges upon Congress at its coming session the passage of a measure along the general lines of the Chamberlain bill for universal military training, and that the cantonments now used by the National Army be utilized, if possible, for such work.

TECHNOLOGY MEN IN HEALTH WORK.

The appointment of Burt L. Rickards, M.I.T. '99, to the post of assistant deputy commissioner of the State Board of Health of New York, suggests that during the summer there has been quite a moving of Tech sanitarians to higher places. Mr. Rickards, who was, nine or ten years ago, head of the bacteriological laboratory of the Boston Board of Health, has been since that time in commercial bacteriology in Urbana and in Boston, and goes now to a most important place in one of the strongest health organizations in the country. It is important to note that the position was one in the Civil Service, and that Mr. Rickards headed a long list of competitors.

Professor S. M. Gunn, '05, of the faculty of the Institute has gone to France recently, where he is associated with Livingston Farrand and Professor Severance Burrage, '92, in tuberculosis work among the civil population. He is associate director of the American Anti-Tuberculosis Commission of the International Health Board, with an office on the Rue de Rivoli, Paris.

Two of the Tech alumni have gone within the past month from New England to the West Coast, where they are in charge of two of the great districts into which California is divided for health administration. These are E. E. Ingham, '14, and R. N. Hoyt, '09. Mr. Ingham has been instructor at the Institute and was the pivot about which the recent important Massachusetts State Health War Conference revolved, while Mr. Hoyt was first health officer in one of the Oranges in New Jersey, coming thence to the coöperative health administration of Wellesley and adjoining towns, a position which he resigned to become health officer of Manchester, N. H. Mr. Hoyt is to have the central district of California, including San Francisco, while Mr. Ingham will have headquarters probably at Riverside.

Professor George C. Whipple, '89, and Professor Charles E. A. Winslow, '98, the latter now at Yale, are returning from the Sanitary Mission to Russia, and the former will take up again his classes at Tech about November 1.

Mr. C. E. Turner, instructor in biology and public health, Associate of the Sanitary Research Laboratory, has been making special field investigations on behalf of the State Department of Health in Maine.

Professor S. C. Prescott, '94, has been invited to undertake special work upon the conservation and salvage of foods by the Food Division of the Medical Department of the U. S. Army, and has already begun his work.

Mr. Horowitz, instructor in biology and public health, has been continuing during the summer his sewage investigations at the Experiment Station of the City of Brooklyn in New York. Professor Stiles was recently invited to give his whole time to food work under the Medical Department of the Army, but was unable to accept because of his urgent duties in teaching.

Mr. Malcolm Lewis, a graduate of the Department of Biology and Public Health, in 1914, has resigned his position as health officer of South Orange, N. J., and become epidemiologist to the State Department of Health of New Jersey, with an office at the State House in Trenton. The large concentration of men at Camp Dix has thrown upon the State Board of New Jersey unusual problems, some of which will be dealt with by Mr. Lewis.

James A. Tobey, late assistant in the Military Department, M.I.T., and a graduate of the course in sanitary engineering, has resigned his position as health officer of West Orange, N. J., to become assistant to the Bureau of Sanitary Service, American Red Cross, in the work of this Bureau around some of the Southern cantonments.

Professor Gunn's work as secretary of the American Public Health Association and editor of the *American Journal of Public Health*, has been assumed by Mr. A. W. Hedrich, late health officer of East Chicago, and last year a member of the Harvard-Technology School for Health Officers.

Mr. F. J. Funk, formerly assistant in biology and public health, has become one of the chief sanitary inspectors of the Bureau of Sanitary Service, American Red Cross, with an assignment for duty at Louisville, Ky.

Mr. A. S. Bedell, a graduate student last year in biology and public health, has been appointed assistant bacteriologist to the State Board of Health of New York.

Mr. F. Bernard, when last heard from, after training at Plattsburg, was commissioned second lieutenant, and had been assigned to work in the Quartermaster's Division.

Mr. J. O. Connolly, a graduate of the course in sanitary engineering, in 1917, a Master of Science, after work with the State Board of Health during the summer, has been assigned for duty in the extra-cantonment zones, under the American Red Cross, Bureau of Sanitary Service.

News has lately been received from Mr. George W. Bakeman of Course XI, who is still doing Red Cross work at Petrograd. He was recently offered the position of vice-consul.

Mr. Philip S. Platt, a former student, after sanitary work in Belgium, in Petrograd, and in Vladivostock, has recently done similar service in France.

The absurd story about women being just now admitted to the Harvard-Technology School for Health Officers has come to the surface again in connection with a reported opening of the doors of the Harvard Medical School to women. The truth is that as soon as the question of women in the Health School was brought to notice,—and that was only a month or two after the opening of the school in 1914,—it was decided that they are eligible to the Harvard-Technology School according to the Technology principle of admitting students without reference to sex or race. There are certain courses, however, usually given in the Harvard Medical School to which women are not admitted, but the coöperative school will accept the equivalent of this work if performed elsewhere. Women can and practically could always take the Harvard-Technology Health School work.

IN MEMORIAM

GEORGE PLUMMER HOWE, A.B., M.D.

First Lieutenant, Royal Fusiliers, Battalion M.O., B.E.F.

Æsculapian Club, Chapter 1904.

George Plummer Howe was born in Lawrence, Massachusetts, December 11, 1878. He went to St. Paul's School, Concord, New Hampshire, and graduated from Harvard in the year 1900 and from the Harvard Medical School in 1904. During the years 1904-1906 he served as surgical house officer at the Boston City Hospital. He then joined the Anglo-American Arctic Expedition as surgeon, and spent the next sixteen months on the north coast of Alaska, returning to San Francisco on a whaler in the fall of 1907. After this he practised medicine for two years in Lawrence, but becoming interested in archaeology in 1909 he entered the Harvard Graduate School to study this subject. He organized an expedition and spent the summer of 1911 in Yucatan. Since that time he practised medicine in Boston, specializing in diseases of the skin and serving on the staff of the Boston City and Carney Hospitals.

September 11, 1911, he married Marion Dudley Endicott. In May, 1917, as a member of the American Medical Reserve Corps he went as an unattached volunteer with rank of first lieutenant, to serve with the British forces, and was assigned to the Royal Fusiliers as battalion medical officer.

He was killed in action September 28, 1917.

Since its inception, George Howe had been a deep and earnest student of the present war. While filled with a wholesome respect for German efficiency, he was always deeply and sincerely devoted to the cause of this country. Of a naturally bold and venturesome spirit, he found the routine of daily practice irksome and longed to be of more active service to his country. He deeply regretted that his nearsightedness prevented him from securing a line officer's commission. It was, therefore, no surprise to his friends that, after joining the Medical Reserve Corps, he gladly responded to a call for volunteers to serve with the British forces in Europe. He served and in such service gave the best that was in him and his life.

George, or "Peter" Howe, as he was familiarly called, was known to many and loved by all who knew him well. Those who have travelled, hunted, and explored with him can vouch for his courage, resourcefulness and cheerfulness under trying conditions; those who have worked with him in hospital clinics knew his loyalty, integrity, and ever readiness to do even more than his share; those who have played with him knew him as a worthy opponent, a kindly victor, and always a good loser, but only those of us who have lived with him and have known him intimately feel the bitterness of the loss caused by his death. An undemonstrative exterior covered a heart big with real kindliness and the spirit of true friendship. To know him a little was to wish to know him well; to know him well was to appreciate his New England common sense, his sterling honesty and his frankness, his keen humor, and his real affection and devotedness to his friends. He died as he lived, loyal and faithful to his duty to the last; he died as he would have wished to die; and we, his friends, gladly, though with sorrow, pay tribute to his memory.

RECENT DEATHS.

Newell Bly Burns, M.D., Assistant Superintendent of the State Sanatorium at North Reading, died of heart disease October 27, 1917, aged 35 years. He was the son of William H. Burns of Melrose Highlands, was a graduate of Harvard College in 1905 and of Harvard Medical School in 1909. He was unmarried. Dr. Burns was a Fellow of the Massachusetts Medical Society.

James D. Hewett, M.D., of New York, died on November 2, at his home in that city. Dr. Hewett was born in Boston, a descendent of Governor Thomas Dudley of the Massachusetts Bay Colony. He was graduated from Trinity College in 1854 and spent two years in studying medicine at the University of Pennsylvania. He received his degree in 1858 from the medical department of the University of New York. Upon the outbreak of the Civil War, Dr. Hewett volunteered as assistant surgeon of the Sixty-sixth New York infantry and won promotion to regimental surgeon with the rank of major. After the war he practised in Boston, but soon afterward returned to New York where he was in active practice for many years.

MARRIAGE.

The marriage is announced of Dr. Rudolf Katz of Amsterdam, Holland, and Miss Fanny Bowditch of Boston, at Zürich, Switzerland. Dr. Katz is a neurologist of note and Mrs. Katz is the daughter of the late Professor Henry P. Bowditch of Boston.

ERRATUM.

Error was made in last week's issue in referring to Dr. William J. Robinson of New York as being editor of the *Medical Review of Reviews*. The editor of that publication is Dr. Victor Robinson also of New York.

SOCIETY NOTICE.

Middlesex East District Medical Society.—A meeting on "Minor Surgery" will be held at 6 p.m., November 21, at the Harvard Club, Boston.

The Boston Medical and Surgical Journal

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Addresses.

WOUNDS OF THE KNEE-JOINT.*

BY SIR BERKELEY MOYNIHAN, LEEDS, ENGLAND.

THERE is probably no department of surgery in which greater changes have been wrought since the early days of the war than in that concerned with the treatment of wounds of the knee-joint. When I was first in France in November, 1914, the majority of the cases of wounds of this joint exhibited, by the time that a base hospital was reached, a grave suppurative arthritis; very often the patient was extremely ill, with a high temperature and all the evidences of a severe constitutional infection; and in a large number of cases only the most drastic procedures offered any hope that the limb might at last be saved. Too often, perhaps, we failed to remember that a man had two legs, and only one life, and conservative measures were pushed to excess. In the work of the French army, as I saw it, amputation was in such circumstances often advocated and practised forthwith; and there can be no doubt, I think, that though some limbs were sacrificed which continued care might have saved, many lives were rescued that would otherwise have been jeopardized or lost.

By degrees, however, as our grasp of surgical principles grew firmer, and as transport facilities increased, cases were obtained earlier, a more direct and deliberate attack was made upon the wounds, and results began rapidly to improve. It was quickly realized that all methods of treatment of a well-established purulent arthritis were miserably inefficient, and that here, as elsewhere, every effort must be directed to such a precocious and drastic treatment of the wound as would prevent the development, never long delayed, of an infection. It was felt to be insufficient so to treat a limb as to save it only with a stiff joint; the aims must be both to save the member and to preserve the freedom of movement in the damaged articulation.

For purposes of academic description, the following classes of injury may be recognized:

1. *Cases of clean perforating wound of the knee-joint by rifle bullet.* There are cases in which a rifle bullet traverses the joint from side to side, often without inflicting any damage, or the most trivial damage, to the bone. In other cases the bullet, or a shrapnel ball, may have entered the joint and have lodged in the lower end of the femur, or in the upper end of the tibia. The wound or wounds inflicted may be small. They are rapidly sealed up, and present no evidences of inflammatory reaction. The joint may, or may not, fill gradually with fluid during the next few days. If fluid forms and is removed, it is commonly found to be sterile. In such cases conservative methods are fully justified by the results. The joint must be perfectly immobilized, and the patient retained if possible at the clearing station, so as to avoid the disturbances often inseparable from travel. Aspiration of the fluid, and the injection of formalin and glycerine, formerly often practised, do not seem to insure or to hasten the recovery.

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* Read before the Clinical Congress of Surgeons of North America, in Chicago, on Oct. 23, 1917.

2. *Cases of penetrating or perforating wounds of the joint with a larger aperture of entry, or of exit, or both, when the projectile is retained in the joint.* All such cases must be submitted to operation. The limb, which should be immobilized at the field ambulance, is kept absolutely at rest until an x-ray examination is made. This is indispensable; under no circumstances may a blind exploration of the joint be made in the hope that the missile, if any, or if many, may be discovered and removed. The surgeon must know beforehand the conditions he will probably meet, and must deal with them purposefully and deftly.

The position and size of the projectile being ascertained, the track of the missile must be determined. The position of the limb as it lies on the splint is, of course, hardly likely to be that which it had when the wound was inflicted.

After the whole limb has been thoroughly prepared in the usual manner, certain definite objects must be pursued. The wounds and the track of the projectile must be excised; missiles must be removed, all foreign bodies, fragments of clothing taken away and such damaged and loosened fragments of bone sacrificed as may appear to be necessary. The technic of wound excision is the same in these injuries as in others; the damaged skin and all the bruised and lacerated track down to and including the synovial membrane are removed, if possible, in one piece. A preliminary sterilization of the track with the actual cautery is an undoubted advantage. How precisely the incision is to be made will depend upon the exact circumstances. A good rule for the surgeon in all his technical responsibilities is that he should see well what he is doing and do well what he sees. These should be endeavors in the knee-joint especially. To make a small incision, and to introduce his finger to "explore" the joint, which may mean to grope blindly and clumsily therein, is not in accord with the needs of cases such as these. A quite adequate exposure is necessary. If this can be obtained by an enlargement of the aperture of entrance, or exit, or of both, nothing more is required; if it cannot, then a long internal or preferably external incision is made; if these are insufficient then the surgeon must make up his mind to a sacrifice of the ligamentum patellae and the making of the semicircular flap fashioned in many cases of excision of the knee, and this must be done. By the time the patient is ready to use his limb the ligament will have united firmly and be competent to bear the strain then placed upon it. There can be no doubt, however, judging by the cases I have seen, that the functional result in all returns more slowly and always less perfectly than in those where only the lateral incisions are made. A free and full exposure of all the injured parts being then obtained, the following injunctions may be observed: to remove all dead tissue, to remove all soiled parts, to remove all foreign bodies, clothing, mud, clots, etc.

How strictly is the surgeon to interpret the rule that all projectiles must be removed? Our experience in England shows beyond dispute that (*a*) if a projectile is embedded in the articular ends of the bones, when the bone has suffered little or no damage beyond that necessarily inflicted by the entrance of the foreign body, it becomes encapsulated and rarely, if ever, gives rise to subsequent trouble, and (*b*) if a projectile, however small, remains in the knee-joint, it is an abiding source of infection and of suppurative arthritis. The most troublesome and tedious of all the cases seen at home are those in which a foreign body has been left in the joint. It is, therefore, a strict and necessary injunction that all projectiles should be removed at the earliest opportunity. All vessels bleeding ever so slightly along the wound are carefully secured. The wound and all parts exposed are gently wiped, and if the surgeon so desires, some form of antiseptic may be used,—ether, or Dakin's solution, or saline solution. The wound is then closed by layer after layer of catgut sutures until the skin is reached. For this, silkworm-gut is used.

Is drainage to be used? In the early months of the war drainage tubes were freely, indeed almost universally, employed. Sir Anthony Bowlby, however, has often emphasized their very real disadvantages. Unlike most surgeons, I believe, he had for many years in civil practice forbidden their introduction in all cases under his care. He has now won all opinion round to his view. There can be no longer any doubt that any form of tube introduced into the joint cavity in these early cases is productive of nothing but evil. Tubes damage the synovial membrane by their pressure, and are a potent and abiding avenue of infection. As a binding obligation, with no objections worthy of consideration, it may be asserted that tubes should never be placed within the joint. It is rare to see in the base hospitals in England, a movable knee-joint when tubes have been used within the cavity. Drainage, however, may be necessary, and is quite inadequately secured by placing tubes "down to but not into" the joint and by leaving a gap in the line of the sutured synovial membrane. The delicate tissue of the synovial membrane then suffers no harm, yet if effusion occurs it finds a ready exit and easy escape to the surface. Dressings are then applied and absolute immobility secured for 8 or 10 days by a splint.

There are cases, probably between 10 and 15% of the total number treated upon these lines, in which an effusion into the knee-joint, larger or smaller in quantity, associated with an elevation of temperature, may occur, generally after the fifth or sixth day.

What is then to be done? This question is to be answered by the bacteriologist and the surgeon working together. An examination of the fluid discharged from the tube, or removed by aspiration of the joint, must be made forthwith. If any organisms but the streptococcus or staphylococcus are found, there is no need as yet for anxiety. In quite a number of the cases, the fluid will prove to be sterile and will leak away by slow degrees through the aperture prudently left in the synovial membrane. Day by day the temperature will fall and the knee assume once again its normal size, and all will at last go well. If, however, the staphylococcus is found, the joint must be watched almost from hour to hour. If fluid is leaking away slowly, and if the temperature tends to fall, and if the patient remains comfortable, then expectant methods may safely be continued. In the great majority of such cases, all danger will subside and the infection will be subdued by the patient's own efforts. Such cases help one to realize the strength of the defensive power that the knee-joint is capable of exercising. When, however, the streptococcus is present, active and timely interference is necessary. The joint must be freely opened by long lateral incisions or by semicircular incisions dividing the patellar ligament. The synovial membrane must be stitched to the skin, and the Carrel-Dakin method adopted. If the infection is of a still graver or more hostile kind, excision of the joint or even amputation may be imperatively necessary.

There are few types of cases, if indeed there are any, which give such genuine gratification to the surgeon practising in England as those treated in France by methods similar to those described. A very large number have now been received into our base hospitals in which, a month or six weeks after an injury that two or three years ago would have meant permanent disablement of the joint as the best attainable result, all movements of the knee are free and unimpeded and attended by no pain whatever. In no circumstances do we realize with such certainty and satisfaction the remarkable scientific advances made by our colleagues working with the army in France.

3. *Cases of perforating or penetrating wounds of the joint with intra-articular fracture.* This condition is a degree more serious than that in which the missile has cleanly entered and become firmly embedded in the end of the femur or the tibia. There is here a shivering of the articular ends with many irregular lines of fracture. In the midst of a soft mass of crushed bone, the projectile may be lying. All such cases must be dealt with ruthlessly. There must be adequate exposure by one or other of the incisions before mentioned; all dead, severely damaged, or entirely loose fragments of bone taken away, the curette or the bone forceps being used to get rid of all bone which is beyond hope of recovery. As a rule, the distinction between sound and doomed bone is easily made. The articular cartilage is, however, always dealt with most sparingly. The future integrity of the joint movements depends upon the preservation of every scrap of this structure.

It will often be found that an injury which before free exposure has appeared trivial is seen, when the joint is opened up, to be very extensive and to require careful and long-continued toilet before all parts are cleansed and removed. It may be necessary once or twice to change instruments, gloves, or towels, in the due observance of the strict aseptic ritual always necessary. When all parts are cleaned, the most perfect hemostasis is secured and the wound then closed.

In many cases in England, we have used Morison's paste (Bipp) to smear over the rough osseous surfaces which remain or over a bruised or inflamed synovial membrane. I have seen several cases of severe infection of the knee treated by Mr. Morison himself, and have been surprised some weeks later to see what a remarkable degree of functional restoration has been obtained. It is in these severer forms of injury to the knee-joint that we have by degrees been brought to realize that our old timidity towards this joint is quite needless. It is no exaggeration to say that with proper care the knee can protect itself from infection almost as well, if not quite as well, as the peritoneum. Our fear of infections within the joint were due to an ignorance of the methods of treatment of them. Most surgeons dealing even with a mild infection, and probably all surgeons dealing with anything approaching a grave infection, relied upon drains introduced into the cavity of the joint to rid the parts of inflammatory products. We know now that nothing but harm comes from a drainage tube placed into the joint. If drainage is necessary it is secured by tubes down to the synovial membrane, but not within it, by suturing the synovial membrane to the skin, or by adopting, as Mayo Robson suggests, a special posture of the limb.

4. *Cases of injury to the knee-joint, with extensive fracture of the articular ends.* The practice to be followed in such cases will depend upon the position and extent of the injury, the number and localization of the projectiles, and the degree of infection. If there is extensive fracture without loss of tissue, it is probable that an attempt to save the knee will be worth while; that even if ankylosis results, the firmness and strength of the limb will be adequate to most purposes. When, however, there is extensive localized loss, as, for example, when one condyle of the femur is blown completely away, then a formal resection of the knee-joint forthwith is probably the best course. In such a case, even if complete healing takes place, the functional utility of the limb is greatly hindered by those deformities which inevitably follow. As much of the femur must be saved in making the resection as can with safety be left, the upper end of the tibia, if intact, must have only the merest shaving of the articular

cartilage excised, that is, enough to allow a bony ankylosis to take place. The amount of the two bones that can be removed without serious disablement is remarkable. I have had one patient whose leg was a trifle over four inches shorter than the other, who walked with vigor and not inelegantly. A part both of the femur and of the tibia had been destroyed by a shell fire.

In cases included in this group where infection has obtained a hold, the method of excision introduced by Colonel Fullerton may be practised. Instead of bringing the opposing ends of the femur and the tibia together, means are taken by extension to keep them apart. A wide gap then is left which may be filled lightly with gauze and the Carrel-Dakin method of treatment adopted. When the wound has reached the stage of "clinical sterilization" the bones may be fitted together and the limb fixed in a splint.

In still more severe types of injury amputation of the thigh is performed without delay. This counsel is especially urgent when the great vessels also are injured, when laceration of the soft parts is extensive, and when infection, especially with the bacillus of gas gangrene, is evident.

CONCLUSIONS.

1. In all cases of wounds of the knee-joint, the limb should be fixed immovably upon a splint at the earliest possible moment, and until circumstances and surroundings permit of a complete operation.
2. At the casualty clearing station, or other operating center, an x-ray examination is made in all cases. The whole limb is then prepared for operation.
3. The following are the essential features in all operations: excision of the wounds and of the track of the projectile after preliminary sterilization by the cautery or otherwise; a free exposure of the joint either by enlarging existing incisions or by long internal or external incisions or by the formation of a flap by division of the patellar ligament.
4. All foreign bodies must be removed from the joint. Even the smallest piece of clothing or of metal may be the nidus of a continuing infection.
5. The wounds are closed in layers by catgut sutures. Drainage is secured by leaving a gap in the line of suture of the synovial membrane, or by leaving a tube close "down to but not into" the joint.
6. Drainage tubes are never placed within the joint cavity. They do not drain the joint, they are harmful in their effects upon the delicate synovial membrane, and they are often a channel by means of which infection is conducted to the joint.
7. In cases of severe infection of the joint by staphylococcus, or especially by the streptococcus, the wounds must be reopened, the synovial membrane stitched to the skin, free drainage of the joint secured, and the Carrel-Dakin or other method of progressive sterilization of the wound adopted. In more severe cases, with an infection rapidly gaining ground, excision of the joint may be necessary.
8. In cases of severe comminution of the articular ends with much loss of substance (the whole of one condyle, for example), a resection of the joint is performed forthwith.
9. In severe and extensive wounds with heavy infection, the method of resection with wide, temporary separation of the ends of the bones (Fullerton) should be practised.
10. In cases of very extensive damage, especially with infection, amputation is desirable.

THE FOUNDING OF THE BERKSHIRE DISTRICT MEDICAL SOCIETY, WITH NOTES ON THE FIRST PERIOD OF THE EXISTENCE OF THE MASSACHUSETTS MEDICAL SOCIETY.*

By Walter L. Burrage, M.D., Boston.

At the one hundred and tenth anniversary of the founding of the Berkshire District Medical Society, one of the oldest component units of the Massachusetts Medical Society, it is fitting that we search the records of the past to learn how the organization of such a strong and enduring society came about, and something as to the character and achievements of the founders, those hardy idealistic pioneers who could truly say, "We look to the hills, whence cometh our strength."

We find in the old minutes of the council of the Massachusetts Medical Society the following entry: "At a meeting of the Counsellors holden at Vila's Hotel, Boston, on Wednesday, the 7 day of October, 1807, a petition was received from certain members of the Society in the county of Berkshire, asking leave to establish a district society in that county, to comprehend all the towns in that county. *Voted*, That the prayer of the said petitioners be granted." Curiosity is aroused at once to learn who were the "certain members," and reference to the Charter Book, so called, in which besides the original charter of the society were entered the names of all new fellows, reveals the following list of eight men from Berkshire County in the order in which they became fellows:

1785	Erastus Sergeant, Stockbridge.
1801	Hugo Burghardt, Richmond.
1803	Timothy Childs, Pittsfield.
1803	Remembrance Sheldon, Williamstown.
1803	Eldad Lewis, Lenox.
1803	Oliver Brewster, Becket.
1804	William Buel, Sheffield.
1804	Horatio Jones, Stockbridge.

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* Read at a meeting of the Berkshire District Medical Society in Pittsfield, Mass., Aug. 30, 1917.

These comprised all the fellows in Berkshire at that time, William Whiting of Great Barrington, first president of a "Medical Association" in Berkshire in 1787 and one of the thirty-one incorporators of the Massachusetts Medical Society in 1781, had died in 1792, and Oliver Partridge of Stockbridge, who had joined the society in 1785 and had been secretary of the above-mentioned association, had resigned on the reorganization of the parent society in 1803. Thus we see that six of the original ten fellows of the society previous to the year 1807, had joined after the passage of the act of the legislature amending the charter.

The records tell us that forty councilors were appointed by the society June 1, 1803, and that Berkshire was allotted one, Erastus Sergeant. The next year the number of councilors was increased to forty-four, and Berkshire was represented by Erastus Sergeant, leading surgeon of Stockbridge, and Timothy Childs, chief practitioner of Pittsfield, and these same men represented the district in 1806, the year before the foundation of the district society.

Twenty years earlier, a medical association, the precursor of the Berkshire Medical Society, had been organized at Stockbridge, following a vote of the Massachusetts Medical Society at its October meeting, 1785, appointing Dr. Sergeant and Dr. Partridge a committee for Berkshire "for the purpose of encouraging the communication of all important or extraordinary cases that may occur in the practice of the Medical Art, and for this purpose to meet, correspond and communicate with any individuals or any Association of Physicians that have been or may be formed in their respective counties and make a report from time to time of their doings to this society as occasion may require." Fifteen physicians attended the first meeting of this medical association at Stockbridge, January 16, 1787, among them besides Dr. Sergeant and Dr. Partridge, being William Whiting, Oliver Brewster and Eldad Lewis. According to their minutes, they met "to form an association for the purpose of observing and communicating those things which may be for the improvement of the art of physick, and of encouraging a spirit of union with those of the Faculty, and of rendering the Faculty more respectable." What a vogue the word "respectable" had in those days! No one was properly born unless of "respectable parents."

William Whiting was the first president; Oliver Partridge, secretary; and Eldad Lewis, orator. There can be no question of the high purpose of those founders and that they were accustomed and ready to overcome obstacles of climate and difficult transit facilities—there were no railways, few roads and many paths—in order to hold their meetings and to advance the standards of the practice of medicine. The second meeting was held in May with an attendance of seven, and the third in June, fourteen being present, and Timothy Childs was one. To show the aims of the founders and to bring home to us the oratory of the time it may not be out of place to cite a few extracts from Eldad Lewis' oration on "The Usefulness of Medical Societies," delivered before the fourteen members of the Medical Association of the County of Berkshire, gathered at Mr. Bingham's in Stockbridge on that twelfth of June, 1787, and carefully recorded by vote in the old record book of the society wherein all the minutes were entered from 1787 to 1864. This book is the source of our information concerning the Berkshire society and is now in the possession of the Berkshire Athenaeum in Pittsfield.

After lamenting the lack of medical schools, hospitals and opportunities to study medicine in this country, Dr. Lewis says: "A society of physicians united upon liberal principles offers a fine opportunity for improvement from the communications of the several members; important incidents occurring in private practice will by this means be rescued from oblivion, talents will be stimulated to exercise, which otherwise might forever have lain dormant and useless, or there will be the greatest and most noble excitements to a laudable emulation and industry. Opportunities also will often present of habituating ourselves to observe accurately, to think justly, to reason truly and analogically and judge with precision." And again: "The natural history of our country is a subject that has been but little cultivated hitherto, for which reason, as well as from its extensive usefulness, it demands our highest attention. Intimately connected with which and more directly subservient to the Profession are the botany and pharmaceutica of indigenous vegetables. No part of the world is more fertile in efficacious drugs than the territory of the United States; to many of these the physicians of other countries are entire strangers, while we ourselves are shamefully ignorant in these matters."

Dr. Lewis hoped that the "association" might control the quacks, at that time a great menace to the community. He said: "It will undoubtedly be in our power, when properly organized, to hinder the illiterate medicaster and ignorant quacks from introducing themselves into the practice, to the danger of the lives of the sick and the injury of the deserving physician." This excellent oration closed with a plea to the members to elevate the pharmaceutical standards of the druggists and to stand together for the public good, to concur in all measures calculated to abolish all odious distinctions and ill-natured competitions among the faculty and to cultivate confidence and harmony in the profession.

The Berkshire Medical Association met again in January, 1788, and admitted five new members, but because of the rebellion led by Daniel Shays and the troubled state of the country there were no further meetings until 1794. In that year, on November 12, fifteen members met at Stockbridge, officers were elected and three censors were chosen. At another meeting, January 6, 1795, the by-laws were revised and signed by fifteen members, including Erastus Sergeant, Eldad Lewis, Oliver Partridge, Horatio Jones, Oliver Brewster, Hugo Burghardt and William Buel. There were two more meetings in this year and two in 1796; then follows a great silence, and the next record is "Lenox, July 1, 1819," thirteen years later. There are no records at all of meetings held in 1807 and in the succeeding years. Search through the records of the council of the parent society from 1807 to 1819 shows that new fellows residing in Berkshire were admitted from time to time, but there is no specific reference to the district until February 4, 1818, when this entry occurs: "A petition having been presented by Hugo Burghardt and others, Fellows of this Society residing in the County of Berkshire, requesting permission to constitute a district society by the name of the Berkshire District Medical Society, and to hold their meetings in the town of Lenox. *Voted*, That the prayer of the said petition be granted." Thus the Berkshire society was born again, and regular meetings have been held and regular records kept since July 1, 1819.

At first the society voted not to accept the charter as granted by the parent society, but at a meeting held May 4, 1820, the charter was adopted. Previously a special committee of the Council of the Massachusetts Medical Society had been appointed, on application from the Berkshire society, to consider whether that society might be granted allowance from their membership fees to defray their expenses. The committee reported to the annual meeting of the Society in Boston, June 3, 1818, recommending that the treasurer of the Berkshire District Medical Society be empowered to collect all membership dues for his district for five years and to return half of the amount collected to the treasurer of the state society. The report was adopted in spite of the fact that two similar requests from the Worcester district society, 1808 and 1816, had been denied by the Council, and the concession must have been of assistance.

In 1821 the Berkshire society was well reestablished, every subsequent meeting was duly recorded and the by-laws were revised and signed September 13, by the following twenty-seven members, who may be regarded as the founders of the present régime:

Asa G. Welch
Henry H. Childs
Worham L. Fitch
John L. Barker
Platt B. Tyler
Hugo Burghardt
Eben Emmons
Robert Worthington
Daniel Collins
George Hill
Alfred Perry
Philander H. Thomas
Henry L. Sabin
Hubbard Bartlett
Millen Sabin
Erastus Sergeant
Luke Dewey
Asa Burbank
Vassel White
William H. Tyler
Charles Worthington
Abner Sears
Enoch Peirce
Selden Jennings
Lyndon A. Smith
Royal Fowler
Coridon Guiteau

In this manner came about a third founding of the society,—the first in 1787, the second in 1807, and the last in 1818-20. Under the auspices of the society the Berkshire Medical Institution was to start within three years (1823) on its long and honorable career in Pittsfield.

In the year 1807 the Massachusetts Medical Society had 160 active and retired fellows. At this time the relatively populous Worcester and Essex Southern districts had in their membership 22 and 20 fellows, respectively. They had been organized in 1804, and were the only district societies formed previous to the Berkshire society.

It may help to an understanding of the situation in 1807 to sketch the conditions under which the parent society had sprung to life under the charter that was approved by the governor, November 1, 1781, just after the surrender of Cornwallis at Yorktown, October 19, of the same year, and to trace the progress of the society from that time to the year that now engages our attention.

The War of the Revolution was over, although the country was to be in a disturbed state until the signing of the treaty of peace in 1783. Many physicians had returned from a military experience, having been brought into touch with new and larger ideas, and there was a feeling that the profession of the country should take its place on a higher plane with the medical men of European countries. The pioneer medical society of the United States, that of New Jersey, founded in 1766, now renewed its meetings that had been suspended from November, 1775, to November, 1781, because of the war which had been waged largely in the territory of that state. The constitution of Massachusetts had been adopted a year before and the first session of the legislature was held October 25, 1780. The founding of the American Academy of Arts and Sciences in Boston in the latter year, on the general plan of the Royal Society of London, may be considered to have had something to do with the organization of the Massachusetts Medical Society in 1781, for Edward Augustus Holyoke, first president of the medical society, Cotton Tufts, chief promoter and president for eight years, and six others were incorporators of both societies, the by-laws of which have many points of similarity. Moreover, John Warren, one of the incorporators of the Massachusetts Medical Society and its president for eleven years, became a fellow of the academy in August, 1781, not long before the Massachusetts Medical Society started on its long and honorable career. Altogether, eighteen of the early members of the medical society had membership also in the American Academy of Arts and Sciences previous to the adoption of the reorganizing act of the legislature in 1803.

Of the thirty-one incorporators of the Massachusetts Medical Society, five were trained in statesmanship, namely, Cotton Tufts, Samuel Holten, John Frink, Sr., William Baylies and Oliver Prescott; three had foreign training: Thomas Kast, James Lloyd and John Barnard Swett; three were scholars: Isaac Rand, Sr., Isaac Rand, Jr., and Joseph Orne; and four had had military training: John Warren, John Barnard Swett, Oliver Prescott and Thomas Welsh. The rest were practitioners from different parts of the state, William Whiting being the only one from the extreme western part, although Giles Crouch Kellogg represented Hadley, and Ebenezer Hunt, Northampton.

Under the original charter of 1781 the number of fellows was limited to seventy. The objects of the society were to effect a system of adequate and uniform medical education, and to elevate the standard of professional intercourse among practitioners; power was granted to examine and give letters testimonial to approbated candidates for the practice of physic and surgery (early phraseology); fellows and officers were elected by the society itself, and meetings were held in April, June and October, and oftener by adjournment. This was in the first period of the society's existence—twenty years. Josiah Bartlett says in his annual discourse in 1810: "Vacancies by death or other causes were filled with senior practitioners, in the respective districts, till the law of 1803." Because of the small membership scattered over a large territory, the society took on a character of exclusiveness and, as time went on, it became increasingly difficult to obtain a quorum at the meetings, and penalties for non-attendance proved of no avail in producing the required numbers. It needed to be made democratic, and this came about at last in 1803.

During the first ten years of its life, the society owed much to its secretary, Nathaniel Walker Appleton, a pupil of E. A. Holyoke, the first president. Appleton, of Boston, was constant in his attendance at all meetings of the society and council. His records, which were writen in excellent chirography with nut-gall ink on rag paper—a rare commodity today—are as legible as they were when inscribed one hundred and thirty years ago. He posted up the Charter Book and attended to a very considerable correspondence, as attested by the minutes and by the letters that have been preserved. Failing health compelled his resignation in 1793, and he died in Ohio two years later, at the early age of 43. When he and Cotton Tufts ceased their labors for the society, after 1795, a period of decadence began. Dr. Holyoke, because of living in Salem, seventeen miles away from the capital where the meetings were of necessity held, was able to be present very seldom, and the second president, William Kneeland, attended only one meeting during his two-year term of service, the vice-presidents, Dr. Pecker and Dr. Tufts, presiding in his absence.

Cotton Tufts, vice-president 1785-1787 and president 1787-1795, was most punctilious in his attendance, coming twelve miles regularly from his home in Weymouth to attend the double meetings—a morning meeting that was adjourned to the afternoon. He reported cases and read papers, and it was during his incumbency that the first volume of medical papers was published, 1790. From the first meeting of the society, July 18, 1782, through his term as president in 1795, thirteen years, first as councilor, then as vice-president, and finally as president Dr. Tufts was absent from only two of the forty meetings of the council held during that time. What a record of fidelity! From papers that have been handed down in the families of his descendants it would appear that he called the first meetings for the organization of the society, and an early draft of the by-laws is in his precise and very legible handwriting.

From 1796 on the meetings were poorly attended; in 1800 the treasurer was instructed not to call upon any fellow for an assessment from June, 1794, to 1800, and in 1802 the first steps were taken looking toward a reorganization. A committee reported January 19, 1803, recommending, "That the society apply to the General Court at their present session that the limitation of the number of the society be removed, and for an extension of its power and privileges." John Dexter Treadwell of Salem, another pupil of Dr. Holyoke, seems to have had a good deal to do with the reorganization, judging by a vote passed by the society, June 6, 1833, on the news of his death.

The society is living today under the slightly modified act of March 8, 1803, which removed the restriction as to the number of fellows, placed the election of the officers in the hands of the council, who held three stated meetings a year and appointed five censors to examine candidates for practice, in the state at large. At this time the councilors were elected by the society, and it was obliged to issue certificates under penalty of a fine. At once the society began to grow. The Charter Book shows a long list of new fellows in 1803 and the succeeding years, and we have noted already that there were 160 fellows in 1807. The meetings of the council were well attended; amendments to the by-laws—a sure sign of progress—were offered each year, and all signs indicated the beginning of that vigorous life which has carried the society through the succeeding century. During the first period the society had friction with Harvard College in the matter of the authority to license practitioners of medicine, and this matter was finally adjusted amicably in 1794. The first annual dinner was given in 1796. Letters preserved in the society's safe show that touch was kept with the other medical societies, notably the College of Physicians of Philadelphia, 1791-92; Medical Society of New Haven, Connecticut, 1791; Medical Society of London, England, 1792; and the New Jersey Medical Society, which after correspondence with the Massachusetts Medical Society in 1788 finally obtained, in 1790, a charter from the New Jersey legislature for a period of twenty-five years. New Jersey suspended its meetings again, from 1795 to 1807, and after that has held regular annual meetings.

One of the features of the act of 1803 was that upon application of any five members to the council that body might establish district societies. In the minutes of the meeting of the council held February 2, 1804, we find this entry: "That the petition for a District Society (presented October 3, 1803) in the town of Boston, to include Roxbury, Charlestown & Cambridge, be granted, but the chairman of said petitioners (Aaron Dexter) be requested to state by next meting of council the members said society will compose." As there is no further entry on this subject it is obvious that the project fell through, for the Suffolk District Medical Society was not organized until 1849. District societies were authorized and established in Worcester and in Essex Southern, both on the same day, June 7, 1804. On October 4, in the same year, a petition for a district society in Lincoln and Cumberland, Maine, was granted, Maine being then a part of Massachusetts; but nothing came of this, and the same was true of a petition of James Mann of Wrentham and others, June 5, 1806, to form a district society in Norfolk. It may not be out of place to state here that after the formation of the Berkshire society, the next year, no other district societies were organized until Hampshire formed its society in 1831.

One advantage of a district society was that such a society had a special board of five censors, appointed by the council, to examine candidates for the practice of medicine, and another was that it could appoint its own officers and make its own regulations, provided they were not in conflict with the by-laws of the general society. The members were required to report to the council "all such cases as may be selected for their importance and utility."

The Pharmacopoeia of the Massachusetts Medical Society was ordered printed in 1807, under the editorship of John Collins Warren and James Jackson, and apothecaries throughout the state were asked to adopt it and committees were appointed to make inquiries as to its working. This was the first publication of its kind in the country. John Warren was president of the society and his son, John Collins, secretary; an oration had been given each year since 1804; the annual assessment had been raised from $1 to $2, and the by-laws had been revised in 1806. Indications were many that the society was progressing when the petition for the formation of a district society in Berkshire received the favorable action of the Council October 7, 1807.

Whether all eight of the Berkshire fellows signed the petition we do not know, but there can be no question that there were able men at the helm, men who were to uphold high standards in the profession and pass on to their successors the torch that was to kindle the fire of medical education in the Berkshire Medical Institution and keep it alight for over forty years. Erastus Sergeant and Timothy Childs represented Berkshire as councilors when the petition was acted on and for several years after. Let us sketch briefly the lives of the founders, getting many of our facts from Dr. Abner Marshall Smith's "Medicine in Berkshire," published in The Book of Berkshire, Pittsfield, 1890.

Timothy Childs, father of Henry Halsey Childs, organizer of the Berkshire Medical Institution, was born at Deerfield in February, 1748. He entered Harvard College in 1764, but was forced to leave at the close of his junior year because of lack of funds. From Cambridge he returned to Deerfield and studied medicine with Dr. Thomas Williams, removing to practise at Pittsfield at the age of twenty-three. In 1774 Dr. Childs was appointed chairman of a committee to draft a petition to His Majesty's Justices of Common Pleas in the county of Berkshire, remonstrating against certain acts of Parliament which had just been promulgated, and in the same year took a commission as lieutenant in a company of minute men. On the news of the battle of Lexington he marched to Boston with his company. Being appointed surgeon of Colonel Patterson's regiment, Dr. Childs accompanied the regiment to New York and to Montreal, returning to the practice of medicine in Pittsfield in 1777. He introduced the practice of inoculation in that town and later, with the assistance of his son, substituted for it vaccination, against strenuous protest. Evidently he was a man of affairs and had interests outside the daily routine practice of his art, for he was elected representative to the General Court in 1792 and later was senator and a member of the executive council. Harvard College conferred on him the honorary degree of M.D. in 1811, he was a councilor of the Massachusetts Medical Society until his death, and, on the organization of the Berkshire District Medical Society he was appointed a censor and was elected its first president. For thirty years Dr. Childs was the leading physician of Pittsfield and was called as a consultant in the neighboring towns, keeping up his activity until a week before his death at the age of seventy-three, in the town of his adoption, February 25, 1821.

The office of censor, to which Dr. Childs had been appointed by the council, was no sinecure in those days. The Puritanical notion that duties must not be evaded was in force. Listen to this extract from Chapter V, Section 2, of the by-laws of 1806, as printed at Salem by Joshua Cushing: "The District Censors shall meet at such times and places as the Counsellors may direct, and no member of a district society shall be exempted from sustaining the office of a censor for the district wherein he resides; and in case anyone, appointed to the aforesaid office, shall *unreasonably* neglect or refuse to perform the duties thereof, he shall forfeit and pay, to the treasurer of the general society, for every such neglect or refusal, the sum of ten dollars." Contrast this with the provisions of our by-laws today, under which the censors and district secretaries are paid from the funds of the general society three dollars for each applicant examined, and each supervisor receives mileage.

The other councilor at the time of the founding of the Berkshire society was Erastus Sergeant of Stockbridge. He was the chief surgeon for the county before the advent of Josiah Goodhue. The son of the Rev. John Sergeant, first minister of Stockbridge, he was born in that town, August 7, 1742. He spent two years at Princeton College, studied medicine with his uncle, the famous Dr. Thomas Williams of Deerfield, and on the opening of the Revolution was major in the 7th Berkshire regiment, serving at Lake Champlain from December, 1776, to April, 1777, and until Burgoyne's surrender. Yale gave him an A.M. in 1784 and Harvard an honorary M.D. in 1811. He joined the Massachusetts Medical Society in 1785 and therefore was familiar with the parent society and its aims, in the first period, during the last years of the eighteenth century, before the temporary decadence had set in. Dr. Sergeant was reputed to be the most skilful operator of his time, and his services were in demand within a wide radius. Tall, erect and thin, his figure was a familiar sight in Stockbridge. He died in the town of his birth of pulmonary hemorrhage while sitting at table, November 14, 1814, at the age of seventy-two.

Hugo Burghardt of Richmond, who was born in Great Barrington in 1771 and was a graduate of Yale, seems to have been an Apollo in his physical proportions. Dr. A. M. Smith quotes this of him: "tall, with a well-proportioned physical organization, erect and graceful in all his movements, he won the notice and admiration of all. Affable in his manners, his geniality threw a halo around his path and made him a most welcome visitor to scenes of suffering and sorrow. In discussion he was strictly logical, clear and convincing." Dr. Burghardt was a pupil of Dr. Sergeant. As a member of the militia he was wounded while opposing the followers of Daniel Shays in 1787, and in the War of 1812 he was a strong partisan for the government and sacrificed a large portion of his property in the cause. Previous to 1822 he was president of the Berkshire Medical Society, and he died October 18 of that year.

Not much is known about Remembrance Sheldon, except that he was born in 1759 and came to Williamstown in response to Shays' partisans and in opposition to Dr. William Towner, the chief physician of that place, who had incurred their displeasure. Dr. Sheldon practised there until his death in 1809.

Horatio Jones of Stockbridge was the son of Captain Josiah Jones of that town, and was born December 30, 1769. Pursuing his studies in Yale, his eyesight failed and he was obliged to give up. Then he took up the business of surveying, with the result that his eyesight and health were restored and he became a student with Dr. Sergeant. How much the pioneers did for medicine before the days of the schools, in instructing students and imbuing them with high ideals of professional attainments and conduct! For a time before beginning practice Dr. Jones was a druggist in Stockbridge. He became a fellow of the Massachusetts Medical Society in 1804 and went to Philadelphia the next year to perfect himself in surgery. In 1810 Williams College conferred on him the honorary degree of A.M. He died in 1815, aged forty-six.

William Buel was a native of Litchfield, Connecticut. He practised in Sheffield for twenty years, and died in Litchfield in 1851, aged eighty-three.

Oliver Brewster of Becket, a lineal descendant of the Pilgrim William Brewster, was born at Lebanon, Connecticut, April 2, 1760. He was employed as a surgeon in Colonel John Brown's Pittsfield regiment and was stationed in the Mohawk valley. Returning to civil life he was said to be especially successful in the treatment of acute diseases. There is no doubt that he had a large practice and was charitable to the poor. He was a deacon of the church and very religious, and his taking off occurred while in attendance on a seriously ill lady. He had just remarked: "I know not what more we can do, but we must all pray for her, and pray for ourselves," when he was stricken with an apoplectic seizure and died six hours later, February 15, 1812.

Eldad Lewis of Lenox had a widespread reputation for eloquence, wherefore he became the first orator of the Berkshire Medical Society in 1787. We have had specimens of his oratory. He settled in Lenox as early as 1778, took an important part in town affairs, assisted in establishing the first town library, and published one of the earliest newspapers in the county, a political campaign sheet. He was a good classical scholar and a forceful writer and speaker besides being a successful practitioner. After living in Lenox for over a quarter of a century, he moved to New York State, where he died.

This paper must close with these brief sketches of the founders. Enough has been said to show the sort of men they were,—idealists that one would expect to work for the bettering of medicine. How the Berkshire Medical Institution came to be organized in 1823 and fostered by Henry Halsey Childs for forty years, noted son of an eminent father, to rival and surpass the Fairfield Medical School of Western New York and the Castleton Medical College of Vermont, including in its faculty many of the eminent medical men of the time and during its life of forty-four years conferring the M.D. degree on 1120 students, must be left for another time. Then it will be interesting to study the troublous time of the Berkshire Society when its membership was small and it was hard to get the annual assessments paid, due to its great distance from the capital and the restricted facilities for travel, necessitating loss of the advantages that were enjoyed by the parent society and by the fellows who lived nearer, in the way of attending meetings and entertainments and the use of the library. Another grievance was the oppressive regulations of the boards of censors. The troubles came to a head April 20, 1831, when a petition asking for relief, signed by Henry Halsey Childs and forty others, was presented to a special meeting of the council. As a result of this petition censors were paid two dollars for each day's attendance upon the meetings of the board, and a rebate was made to the district society of one-third of the amount of the dues collected by the district treasurer, to be appropriated to the purchase of books for a district society library, and a loan was authorized of as many as sixty volumes from the library of the parent society. Thereafter began a period of rejuvenation. With the opening of the Boston and Albany Railroad transportation was improved; the membership increased and today numbers eighty-two fellows.

The Massachusetts Medical Society held its annual meeting in Pittsfield in 1852 and again in 1863, when Timothy Childs, son of Henry Halsey, was anniversary chairman. Franklin Kittredge Paddock of Pittsfield was president of the society in 1894-96, and successfully piloted it through much progressive legislation. Looking back over all the years, it is interesting to see how much is owed to the courage and fortitude of the pioneers who builded well for the coming generations by their unceasing labors for an ideal.

Medical Progress.

PROGRESS IN GYNECOLOGY.

By Stephen Rushmore, M.D., Boston.

Gonorrhea.

Hess[1] discusses the use of gonococcus vaccine as a means of detecting latent gonorrheal vaginitis in children, "provocative vaccination." The latent form of the disease is especially dangerous in asylums and homes. If once the disease is admitted, the danger of an epidemic persists until the patient is cured. In a hospital, the danger to other patients is over when the infected individual is sent home cured of the disease on account of which she was admitted.

Every candidate for admission to the "Home for Hebrew Infants" receives a subcutaneous injection of the vaccine. At first, injections were made at intervals of three days, doses of 250, 500 and 750 millions being used. Smaller quantities, however, prove efficacious, and now 100, 200, and 400 millions are employed. As the third injection has never yet been successful, it may well be omitted. That is, if latent disease became active it was no later than after the second injection that it made itself manifest in Hess' series of cases.

The incidence of gonorrhea was found to be surprisingly high. About one-half of the female children seeking admission (for all causes) were infected, and these individuals came chiefly from their own homes, and not from other institutions.

As a result of this provocative vaccination no infected case has slipped into the general hospital from the admitting pavilion in the past year, and on several occasions when active disease has developed in individuals who had been in for a long time, the vaccination has shown latent disease in certain carriers who had hitherto escaped detection. The reaction seems to be not absolutely specific, for at times similar injections of staphylococcus vaccine give positive results, yet gonococcus vaccine has been found to be the more reliable.

There seems to be very little, if any, constitutional reaction, but there appears a purulent vaginal discharge with specific organisms in individuals in whom not only were no organisms found previously, but no pus was present. Hess says the vaccine may be used "prophylactically" also; here the course of the disease is entirely changed, becoming very mild; in some patients no discharge was present and very few pus cells with microörganisms were found.

There was opportunity for post-mortem examination in four cases. Macroscopically, the vagina appeared negative, even in the case in which the disease had existed for only three weeks. The uterus and the appendages were also normal. The only abnormal condition was redness of the tip of the cervix, which, however, did not extend along the cervical canal to the internal os.

Sullivan and Spaulding[2] present their findings as to the prevalence of gonorrhea in a series of 500 delinquent women who had recently been in the Reformatory for Women at South Framingham. Their paper gives conclusions which are in the form of summaries and, therefore, not suitable for further condensation, but certain of the facts which they bring out deserve widespread attention.

The cases may be divided into groups, according to the type of offense for which the individual was committed. The first group included all women serving sentence for an offense which certainly or probably has a sex basis; of these, 86.6% showed positive gonorrhea. The second group gave a history of promiscuous sex relationship, but were serving sentence for some other offense; of these, 76.8% showed positive gonorrhea. The third group included those who gave no history of sex promiscuity and who were serving sentence for other offenses; of these, 44.7% were positive. Among prostitutes (289 cases) gonorrhea was found in 98.2%, syphilis in 65.5%, while a doubtful Wassermann was present in 9.5%.

In 500 consecutive cases of delinquency, 75.7% showed gonorrhea, 44.7% showed syphilis, and 9.3% gave a doubtful Wassermann. In 119 who should be permanently segregated on account of mental defect, gonorrhea was present in 90.8%, syphilis in 61.3%, and a doubtful Wassermann in 6.7%. Consideration of these figures tends to bring a realization of the seriousness of the problem of sex disease.

The conclusions of Sullivan and Spaulding should be considered carefully by the medical profession, for they point out definite lines of action leading to improvement in the present situation. Three methods of dealing with venereal disease among delinquents are presented.

1. Permanent segregation of the mentally defective (24% of this series), of whom 61% have syphilis and over 90% have gonorrhea.
2. Early diagnosis and intensive treatment of all persons who pass through the courts and are detained in public institutions on any charge.
3. Provision of hospitals throughout the country for the treatment of such infected persons. While it may not be considered feasible just now to have hospitals exclusively for venereal disease, there should be special wards in all hospitals where venereal disease might be treated.

The problem is medical as well as social, and it can be solved only as the physician appreciates his responsibility and enlists his interest and influence.

Syphilis.

Norris[3] reports a case which he regards as syphilis of the uterus, although microscopic examination showed no gumma, and the spirochete was not found. The patient was 36 years of age; had three children, of whom the youngest was seven years old. Six years before admission, the patient apparently acquired syphilis from her husband. Both were given specific treatment at that time. Since the syphilitic infection three miscarriages had occurred, in the second, third and fifth month, respectively. The patient came to the hospital for menorrhagia, persisting since a miscarriage six months before. Hemoglobin, 52; red blood cells, 5,000,000; leukocytes, 4500; Wassermann strongly positive. Pelvic examination showed normal parous organs, no evident cause for the bleeding. Exploratory curettage was advised.

During the operation the uterus was found to be so friable that the cervix was torn and the fundus was perforated, though no undue force was used. In view of the history and the findings, a supravaginal hysterectomy was performed, leaving in the tubes and ovaries. Microscopical examination showed diffuse chronic inflammation with marked angiosclerosis in the endometrium, and in the myometrium less inflammation but considerable angiosclerosis. The histological picture here, though not characteristic, resembles that described by other writers. It is doubtful if syphilis of the uterus shows any characteristic changes, in the absence of gumma and the spirochete.

A review of the literature shows few well-authenticated cases of syphilis of the body of the uterus; the cervix is affected somewhat more frequently. The disease is found chiefly in the endometrium, of which a "gummatous endometritis" has been described. Since the introduction of the Wassermann test and the finding of the spirochete, there has not yet been a comprehensive study of the endometrial changes with reference to syphilis, and an excellent field for investigation is here presented.

Peterson[4] presents the results of the study of several series of cases at the clinic of the University of Michigan, with reference to the presence of syphilis, especially in gynecological and obstetrical cases. His conclusions may be given briefly. Especially in hospital practice, where even careful histories fail to arouse the suspicion of latent syphilis, routine Wassermann tests should be made in gynecological and obstetrical cases, in the interest of the patient. The history is often negative. Among patients certainly luetic, only 5 of 22 gynecological cases, and 8 of 18 obstetrical, gave a history of syphilis. The percentage of syphilis in the whole number of patients was about five, but would vary in different clinics, and would probably be higher in the large urban hospitals. In the maternity cases, appropriate treatment with salvarsan and mercury gives a better chance for a living child.

In this connection the findings of Williams and Kolmer[5] are interesting. Their series comprised 300 gynecological and obstetrical cases. "The percentage of positive reactions (22.6%) corresponds closely with the generally accepted incidence of syphilis in adults. The incidence of syphilis in gynecology, on the basis of a Wassermann reaction, is so definite that this disease cannot be excluded on the basis of a negative history and the absence of demonstrable evidences of syphilis; while a particular lesion may not be syphilitic it is, however, highly important to institute antiluetic treatment if syphilis is demonstrated by the Wassermann test.

"Of particular interest is the relatively high percentage of positive reactions observed in the following conditions: stillbirths, 75%; rectal disease, 50%; amenorrhea, 50%; habitual abortion, 50%; pelvic inflammatory disease, 36%; sterility, 33%; abortion and miscarriage, 29%; metrorrhagia, 20%; myomata of the uterus, 16%; gonorrheal vaginitis, 10%; pregnancy, 17%.

"The history of infection has been obtained in but a few cases. This is a well-known fact; it is not the intention of the patient to deceive, but the primary lesion is overlooked and the secondary stage may have been disregarded. The high degree of latent syphilis should make a routine Wassermann test in gynecological and obstetrical practice as advisable as any other laboratory procedure; it is certainly as advisable here as in medical or surgical cases.

"In view of the frequency of latent syphilis as revealed by the Wassermann test, and the scant attention paid to syphilis as an etiological factor in the production of pelvic pathology in women, we feel that a routine Wassermann reaction and the subsequent histopathological study of the tissues removed from syphilitics may bring more light to bear on this neglected phase of gynecology."

Salpingitis.

The possibility of pelvic inflammation in the female, secondary to infection elsewhere in the body, has long been recognized, but the occurrence has been regarded as of great rarity. Definite proof rests only upon careful pathologic and bacteriologic work. Danforth[6] reports a case in which he thinks adequate proof is presented.

A young woman was operated on for acute gangrenous appendicitis; no drainage. Operations one, three, five and eight years later for relief of adhesions gave only temporary relief. Nine years after the first operation the patient underwent another laparotomy, at which there were found many adhesions in the pelvis and lower abdomen. Both fallopian tubes were removed on account of infection, increase of size, and the presence of numerous small white nodules. These showed streptococcus hemolyticus in pure culture. Vaccine treatment gave severe local reaction in the pelvis. Frequently in the six months following the removal of the tubes there was slight fever, and as the tonsils were enlarged, following an acute attack of tonsillitis a year before, the tonsils were removed. At the time of the acute attack streptococcus had been found in the tonsils in pure culture. Six months after the removal of the tonsils, as there was again slight elevation of temperature and discomfort in the neck, an x-ray of the teeth was taken and an alveolar abscess was discovered. The teeth were extracted and the pus showed a pure culture of streptococcus.

It seems probable that hemogenic infections, acknowledged now in some organs to be far more frequent than was suspected a few years ago, are not at all rare in the fallopian tube. The frequency of ascending tubal infection has tended to direct attention away from any other route.

While this case is not absolutely convincing, it is very suggestive, especially in connection with the work of Rosenow and of Davis.[28]

Tubercular Adnexitis.

Under this heading Geist[7] presents a study of tuberculosis of the tubes and ovaries, considering etiology, source of infection, pathology, symptoms, diagnosis and treatment, and reports briefly a series of twenty-eight cases from the Mount Sinai Hospital. Several points may be repeated. There is nothing characteristic in the symptoms; they are of chronic pelvic inflammation, but often without the history of any acute attack. Nearly all of the patients are sterile, and in some sterility is the complaint. Menstruation may be scanty and irregular or sometimes profuse and painful.

Frequently the diagnosis is not made until operation, and sometimes only in the laboratory. Chronic tubal disease in a virgin is tuberculous in 90% of the cases. A point which should arouse suspicion is the presence of a chronic pelvic inflammation of unknown origin, which does not improve, even temporarily, in spite of all treatment. Occasionally the diagnosis is made by accident, from curettings.

The question of treatment presents difficulties. Genital tuberculosis does not of itself cause death and has some tendency to heal spontaneously. If the diagnosis is fairly clear without operation and tuberculosis is present elsewhere in the body, operation is contraindicated. If no other lesions are evident, hygienic treatment may give a local cure,—the ideal treatment, if it can be carried out, when lesions are not very far advanced and symptoms are not marked.

If hygienic treatment is not possible nor advisable, for social or pecuniary reasons or because symptoms are marked, operation is indicated. In younger women a tendency to conservatism is advisable, in older toward radicalism. Hygienic treatment is always necessary to get the best results, whether operation is or is not performed.

Post-operative complications are not uncommon in spite of the most careful precautions. The abdominal wound frequently breaks down; fistulas form in the advanced cases. Old smouldering foci elsewhere in the body may light up, and, too, mixed infections may occur, sometimes resulting fatally. A study of the immediate results in the cases reported should make one cautious about subjecting these patients to operation. The average stay in the hospital was six weeks.

Hematometra.

Gellhorn[8] reports a very unusual case of hematocolpos, hematometra and hematosalpinx, in a woman of 74. She had never been pregnant and menstruation had always been normal, ceasing 35 years before. Severe pain and symptoms pointing to obstruction of the urinary flow led to the detection of a large fluctuating tumor which filled the entire pelvis and extended upward almost to the umbilicus. Operation under spinal anesthesia was followed on the fifteenth day by fatal embolism.

The case raises several questions, some of which can be answered easily. The obstruction in the vagina was due to adhesion of opposing vaginal walls, following so-called senile vaginitis. The bleeding, so long past the climacteric, was due to carcinoma of the body of the uterus. The obstruction leading to hematosalpinx is not perfectly clear in its etiology. Gellhorn attributes it to the damming back of the blood, but it has generally been referred to some inflammation apart from that due to the organization of unclotted blood.

Uterine Infection.

The Carrel method of treating septic wounds with Dakin's solution has been recommended and described by Sherman.[9] The special apparatus employed in the treatment of infection in the uterus is briefly described in the original article. The method should have a fair trial, for if it should give in uterine sepsis results comparable with those already obtained in the treatment of external infected wounds it would be a most valuable resource to the obstetrician and gynecologist.

Myomectomy.

Stacy[10] reports the results of myomectomy at the Mayo Clinic. It has been generally recognized that the operation is more dangerous than hysterectomy, but of course the size and position of the tumor must be taken into consideration. In Stacy's series of 323 cases, there were 226 abdominal and 57 vaginal myomectomies, with a mortality of .6%. In 22.5% there was an elevation of temperature following operation, but no complication to prolong the convalescence beyond the usual time. Of 226 abdominal operations, 172 were done primarily for removal of the tumor. In the remainder some other pelvic operation was associated with myomectomy. Multiple myomata were found in 36%.

The late results are the most interesting. Replies were received in regard to only 203 patients. Six had died (cause not stated). Hysterectomy had been done later in 7. Curettement had been done later three times. The menopause had occurred since operation in twenty. In regard to pregnancy, six miscarriages had occurred, three in one patient; normal full-term pregnancy, eighteen times. There were six cases of pregnancy following operation, in patients who had been sterile before. At the time of myomectomy, four patients were pregnant; all went on to normal full term.

So in patients under thirty-five, if myomectomy is possible, it should be seriously considered; and the patient should have the opportunity of choosing between myomectomy and hysterectomy, fully understanding the possibility of a later operation if myomectomy is done.

Removal of Myoma by Morcellation.

Child[11] advocates morcellation as a routine procedure in the treatment of large myomata of the uterus, a method of attack hitherto reserved for certain extremely difficult cases. Two chief advantages are claimed: a small incision and greater safety in tying the large vessels. Child prefers the low transverse incision with all its advantages. By grasping the tumor with heavy traction forceps, keeping the tumor always close to the abdominal wall and removing pieces of the tumor from the exposed area, handling of the intestine is almost completely avoided. The loss of blood is not much, if any, greater than by other methods. The large vessels are not tied until most of the tumor is removed, and then the broad ligaments are lax and easily exposed. This is in contrast with the tense ligaments often seen with large myomata.

On account of the slight trauma to the intestine during operation, there are few post-operative intestinal complications and the general course of the convalescence is smooth. There is appended a list of fifty consecutive cases, with no mortality.

Cancer of the Uterus and Percy Cautery.

Smith[12] discusses one hundred cases of carcinoma of the cervix of the uterus treated at the Mayo Clinic by the Percy cautery. The operator uses the cautery with one hand, and with the abdomen open, holds the uterus with the other, thus controlling the temperature and position of the cautery. Cauterization without opening the abdomen cannot be thorough. The vaginal dilator has been discarded because it tends to give linear tears which, though small and of themselves of no importance, have in some cases been found later to be the seat of implantation metastases. Following cauterization, the vagina is thoroughly washed out with tincture of iodine. Recently the internal iliac arteries have been ligated and one or both ovarian arteries, to control the hemorrhage which occurs later in about 40% of the cases, if ligation is not performed.

Bladder fistulas, usually vesico-uterine, occurred in 10% of the cases and healed spontaneously, except one case which was operated on. Smith thinks it would have healed if it had been left alone. The operative mortality was 1%, not due to the operation. Of the series of one hundred, twenty-six were later subjected to total abdominal hysterectomy. In nineteen of the twenty-six specimens, the pathologist was unable to find any carcinoma. In seven it was found. The usual time for the hysterectomy was four weeks following the cauterization, although some cases went several months.

Smith estimates the limit of the effect of the heat at three centimeters, and says that he is of the opinion that there is more danger from too cold than from too hot cautery. It is important to pass the cautery well up into the uterus as the disease may be present at the level of the internal os.

The cases may be divided into four groups according to the extent of the disease.

1. Growth limited to part of the cervix only. These are treated by opening the abdomen, cauterizing thoroughly, and then doing immediately a complete hysterectomy. There was only one of this group in the series.

2. The disease is still limited to the cervix, but this includes cases with a large cauliflower

growth, in which there is sometimes only slight involvement of the cervix. The uterus is freely movable. It seems probable that of this group a large proportion will have cauterization and immediate hysterectomy among future cases.

3. There is restriction of mobility of the uterus with involvement of the broad ligament and vagina, but not to fixation or glandular involvement.
4. The uterus is fixed.

Of one hundred cases, fifty-three belonged to Group 4. Of twenty-six cases operated upon, fourteen were from Group 3, eleven from Group 2, and one from Group 1. In the third group formerly operation would not have been considered as a primary procedure. Following cauterization, these frequently improve greatly and then appear to be good operative risks.

Leonard and Dayton[13] report two fatalities after the use of the Percy "cold iron" method in the treatment of inoperable cancer of the cervix. The histories are given in detail, including the post-mortem findings. The Percy technic was carefully applied, yet uninjured carcinomatous tissue was found within one centimeter of the site of the heating iron, so that the technic must be regarded as ineffectual in the eradication of carcinoma. Apparently in both cases death may be attributed to the treatment.

The findings in one case indicate that lesions similar to those in fatal cases of cutaneous burns may be produced; though this patient died suddenly of pulmonary embolus, the other lesions present would undoubtedly of themselves have produced death in a short time.

The mass of sloughing tissue forms a medium for the growth of microörganisms which may spread through the local thrombosed vessels to the general circulation. It seems probable that the greatest danger in the application of the Percy cautery is a local infection and subsequent general sepsis. Only one detailed report of a fatal case was found in the literature (Boldt), but Percy refers briefly to the findings on post-mortem examination in four cases. It seems probable that there has occurred a much larger number of cases than has yet been reported.

Bancroft[14] also reports the post-mortem findings on a case treated with the Percy cautery. There were no lesions found at autopsy which indicated any error of technic, and the patient had died with symptoms of severe toxemia in about forty-eight hours ofter the treatment had been given. There had been no signs of hemorrhage or peritonitis. There were found areas of uninjured cancer cells beyond the reach of the cautery. There were no signs of gastric ulcer, as in superficial burns and in one of Leonard's cases. No apparent cause for the death was found on macroscopic or microscopic examination of the organs.

Clinical Course of Cancer.

Gaylord,[15] in a résumé of some of the results of laboratory research in cancer, which are of value to the clinician, calls attention to certain facts of special interest to the surgeon. He says: "Reasoning from the experimental demonstration of these (immunizing) forces in inoculated animals, to the existence of such forces in animals spontaneously suffering from cancer and to the phenomena observed in the clinical course of cancer in human beings, we have before us the logical explanation of many of the vagaries and ill-defined phenomena in cancer in man. We understand now why surgical interference is so successful in the very first stages of cancer, and why it is so unsatisfactory in the later stages. We should be cautioned against tedious and long-drawn-out operations, using ether or chloroform as an anesthetic and associated with marked loss of blood; and we can offer certain evidences that show that x-ray and radium exercise their curative effect through the immunity" and not through their direct action on the tumor cells. In the bibliography Gaylord gives the references to the experimental work by various investigators, which furnishes the basis for these conclusions.

Precancerous Changes in the Uterus.

The study of the histology of cancer and of organs in which cancer develops has led to the conception of "precancerous changes"; that is, "such pictures that one feels reasonably certain that a malignant growth is in a developing stage." We have then the conception that "it is not true that a pathological condition must be either cancer or not cancer. It may be neither the one nor the other. It may be in the process of becoming cancer." Without stopping to consider the interesting problem presented by this point of view, we may study the changes which are regarded as "precancerous" in the uterus, as set forth by Stone [16] in his résumé of the subject.

Metaplasia, by which is meant in this connection transformation of the cylindrical epithelium of the uterus into the stratified variety, is regarded as a precancerous condition, though it is by no means always followed by cancer, and occurs congenitally and following chronic inflammation due to gonorrhea, tuberculosis, and perhaps syphilis. But true epidermization, except in the presence of polypi and other benign tumors, should always be regarded as suggestive of cancer. Hitschmann says it does not occur except as a malignant process.

It has been observed that cancer develops in cervical erosions. But the apparent infrequency of cancer following this very common lesion suggests strongly the absence of histogenetic development. However, in the healing of erosions, atypical proliferations of epithelium have been noted with sufficient frequency to suggest that some of these cases might have gone on to definite cancer.

Leukoplakia may also be regarded as precancerous because in so many instances definite malignancy has developed later; yet some regard it as already cancer in an early stage, that is, with little invasive property. The tendency to atypical growth of the epithelium of uterine polypi is well known and polypi are regarded as having a malignant tendency. The same is true of the epithelium adjacent to submucous fibromyomata, where, owing to circulatory and nutritional disturbances, metaplasia is not unusual.

In glandular hypertrophy and hyperplasia deviations from normal may at times be distinguished from cancer only with difficulty. Stone's article is illustrated by a number of microphotographs of precancerous conditions which are very interesting.

Cancer of the Uterus—Operation.

Peterson[17] discusses the extended operation for cancer of the uterus with frankness and fairness. Increasing experience strengthens the belief that it is not an operation for inexperienced hands. Both primary and ultimate results must be taken into consideration, and the operator must be honest in reporting cases. While "makeshift" operations, begun as radical but completed with macroscopical cancer still in the body of the patient, may be justifiable, they should be called incomplete and not extended operations. The result will determine whether they were radical or not, but they should be properly named.

Cancer of the body and cancer of the cervix should be considered separately, both as to primary and as to late results. A critical study of the cases of cancer of the body leads Peterson to advocate the extended operation for this group also; the usual panhysterectomy gives less favorable results.

In the cases of cancer of the cervix, the hoped-for reduction in the primary mortality through improvement in technic has not been realized in spite of occasional series of seemingly very good results. For the whole series it rises to slightly over 25%. These deaths emphasize the fact that each patient must be studied as an individual. Lungs and kidneys and heart and whole vascular system must be taken into account. A tumor may be eradicable yet inoperable because of weak or diseased kidneys. In general, a patient with carcinoma of the uterus is a poor risk.

Whether the growth is or is not eradicable can be determined in many cases only after opening the abdomen; but just because a patient will die of cancer if not operated upon does not justify any sort of an operation, no matter how severe.

It has seemed as if the operability of cases in the latest series was lower than in the earlier, but this cannot be determined exactly because other methods of treatment have been given a trial—for example, the cautery. This Peterson uses now only as a palliative measure; sometimes in preparing a cancerous cervix for radical removal.

The end-results are gratifying, though leaving much to be desired. Computing by Wertheim's formula, a permanent cure (five years or more) was obtained in 47.3% of all cases operated upon, and in 62% of all who survived the operation. This compensates in part for the high mortality at operation; and Peterson still favors the radical operation as the best means of treating cancer of the uterus.

Cancer of the Uterus—Radium.

While there has been reported of late little further progress in the use of radium in cancer of the uterus, Clark's[18] summary of his experience and formulation of views, which represent the general consensus of opinion, deserves careful reading. He emphasizes the highly unsatisfactory results of the surgical treatment of cancer, although until recently surgery offered practically the only hope of cure.

Between cancer of the cervix and cancer of the body of the uterus there is a great difference which should be recognized. Operative treatment of cancer of the body, even if disease is well advanced, gives relatively satisfactory results. In cancer of the cervix, operative treatment gives relatively satisfactory results only if the growth is sharply circumscribed. If the case is borderline, operation is very unsatisfactory, giving high initial mortality, high morbidity, high percentage of recurrence.

For borderline and inoperable cases Clark has used radium, in doses of from eighty-five to one hundred milligrams. It is not a panacea, it is not uniform in its results, and there is no way of telling in advance which cases will be benefited. Sometimes growth seems to be actually accelerated. Other cases show an astounding improvement and some a local cure. The morbidity following treatment is much less than following operation, so the tendency is to use radium in all borderline cases. But "the cloud that hangs over the remedy is the danger from unbridled optimism." It is too soon to be sure of ultimate results.

Cancer of the Uterus—X-ray.

Pfahler[19] again calls attention to the value of x-ray in deep malignant disease, especially as a post-operative procedure. Through the introduction of the Coolidge tube and "crossfire" method and adequate filtration, the therapeutic effect can be vastly increased without much danger of burning the skin. In metastatic carcinoma of the bone, following removal of the breast, remarkable improvement followed the use of the x-ray.

With x-ray may be combined electro-thermic coagulation and occasionally radium, which is, however, similar in its action and therefore should be employed simply to give another point for crossfiring, and should not be applied to the same surface as the x-ray. While no case re ports of cancer of the uterus are given by Pfahler, he calls attention to the obvious advantage in the conditions following operation and in the cases of recurrence. Even for the inoperable cases, there may be offered some hope of cure, Pfahler thinks,—some benefit in practically all, and, at least, temporary improvement. The method should be more widely used.

Uterine Hemorrhage and X-ray.

The time has come when judgment can be passed on the x-ray treatment of uterine bleeding with some degree of confidence, for considerable time has elapsed since it was first used, and the number of cases is large. Frank[20] gives some results of his own experience and refers briefly to the literature. The selection of cases, the general directions, the control of physical findings, should remain in the hands of the physician, while technical questions should be left entirely to the x-ray specialist.

The action of the x-ray is at least twofold,—on the ovary and on the uterus itself,—though clinically the two cannot be distinguished. The application may be fractional, that is, short exposures repeated two or three times weekly over long periods of time, and especially to be recommended if reduction of bleeding and not amenorrhea is desired; or intensive, employing enormous doses at each sitting by which amenorrhea is more easily obtained. By combining the two methods a skilful technician can produce effects almost at will.

Frank says the treatment is applicable in functional menorrhagia of adolescence, maturity, and in the menorrhagia and metorrhagia due to fibromyomata. It is especially applicable at the climacteric, but malignant disease should first be excluded. It is in the fibromyomata that the treatment has given the greatest amount of discussion. In suitable cases the results are reported as being almost uniformly successful, but while Kroenig and Gauss regard 85% of their cases as suitable, Frank thinks only 5% of his cases fall into this category.

In the first place, cancer must be excluded by exploratory curettage. If deformation of the uterine cavity is present, preventing thorough curettage, the case is not suitable for raying. Then complications which would render x-ray useless are not infrequent, while distinct contraindications were found in 18½% in Frank's series. The expense of the x-ray is considerable, fractional exposures costing approximately three dollars a treatment, and intensive exposure from one hundred to three hundred dollars. While, therefore, the x-ray may be regarded as invaluable within proper limits, the field of usefulness is distinctly narrow. The main danger is in the case of overlooked malignancy. "Hence the treatment should always be controlled by the trained gynecologist, because diagnostic accuracy is far more essential than if operative measures are contemplated."

Endometrium in Myomatous Uteri.

Geist[21] brings forward the suggestion, made some time ago, that the cause of abnormal bleeding from the uterus in the case of myoma of the uterus is a disturbance of function of the ovary. The anatomical basis for this view on the part of Geist is that in the series of cases studied there were found in a large percentage certain changes in the uterine mucosa, namely, a "hypertrophy of the endometrium." Atrophy was occasionally found, but it was associated with large tumors and was apparently due to pressure. The anatomical change in the ovary is most often a large corpus luteum, occasionally cystic. It has been pointed out by Meyer and Ruge that the acme of the development of the corpus luteum coincides with the greatest hypertrophy of the endometrium in the premenstrual stage of the menstrual cycle. Geist says "these findings seem to us very significant in view of the fact that the ovarian influence is of primal importance in regulating the normal hemorrhage from the uterus, and it seems reasonable to suggest as a possible etiological factor for the atypical hemorrhage associated with fibroids, disturbance in the function of the ovary, perhaps of the corpus luteum." In this connection it is interesting to compare Halban's view, that absence of bleeding with an ovarian cyst suggests overgrowth of the lutein tissue.

Uterine Prolapse, Cystocele, Rectocele.

Frank[22] discusses at length the subject of uterine prolapse and the conditions often associated with it—rectocele and cystocele. The normal anatomy of the parts involved is first described, then the pathological anatomy, the selection of the operation best adapted to relieve the condition present, the preparation of the patient for operation, the anesthesia, suture material and drainage, and, finally, the operative technic.

Frank attempts to standardize the plastic operations so that an anatomical repair may be performed, as is done as a matter of course in an inguinal hernia operation. The attempted anatomical repair in perineal lacerations by suture of the levator ani muscles does not meet with Frank's approval, for reasons which he specifies. That is, it is more limited in its applicability than is generally taught. The same may be said of interposition of the uterus for prolapse.

One difficulty in the way of standardizing operations for repair of injuries of the cervix, vagina and perineum is that the landmarks are not often clear. Lacerations and stretching do not follow the same lines in all cases. It is safe to say that no two cases present identical conditions. Yet the effort at standardization is wise, and Frank's descriptions are, in general, clear, and his conclusions are sound. The article is too long to be abstracted satisfactorily, but should be read by all who are interested in plastic operations on the vagina and perineum.

Some of the details—and details are of great importance in plastic surgery—will not meet with general approval, as the extensive use of silk as suture, introduction of a strip of iodoform gauze into the uterus as a drain after every curettage, and drainage of an oozing incision by a strip of iodoform gauze.

Amenorrhea and Organotherapy.

Koehler[23] discusses the subject of organotherapy in amenorrhea, and reports several series of cases treated with different gland extracts. In general, two explanations of the effect of internal secretion in relieving amenorrhea have been given. A hypothetical deficiency of ovarian secretion being present, it may be replaced by introducing ovarian secretion in the form of ovarian or corpus luteum extracts. Or, by an indirect method, the secretion of some other gland may be employed, as the hypophysis, which will stimulate the ovary to increased activity. A third explanation is suggested by Koehler, namely, that the stimulating substance, present in both ovarian extract and pituitary extract, is not specific but belongs to a chemical group common to most or all of the glandular organs.

The experimental cases, then, fall into three groups: (1) those treated with luteo- or ovo-glandol, which theoretically have a direct replacing effect on the ovary; (2) those treated with hypophyseal extract, which has a supposed stimulating effect on the ovary; and (3) those treated with entero-glandol, an extract of small intestine mucosa, which presumably has nothing to do with the ovary. There were eight cases in the first group, twelve in the third, and several others treated with various combinations of substances. The cases in the second group are not reported in detail because the results are in accord with the favorable outcome reported in similar groups by numerous investigators. In the first group three of the eight were failures. In the third group, only one was negative, which may, perhaps, be ascribed to insufficient treatment, as the patient withdrew after a few injections. The number of injections varied from three to eighteen, at intervals of one to three days, sometimes intramuscularly, sometimes subcutaneously.

In connection with the first group, it is interesting to note the view, which is gaining ground, that the corpus luteum produces the premenstrual changes in the endometrium, and does not in itself cause bleeding. Bleeding occurs at a time when the corpus luteum is actually past its highest development and when the secretion is diminishing. In fact, bleeding will occur sometimes during and sometimes after injection. This suggests that the luteoglandol is not specific. The double effect of pituglandol, especially in the adolescent, of producing menstruation in amenorrhea and also in checking menorrhagia, is again suggestive. The fact that entero-glandol relieves amenorrhea indicates more definitely that the action is not specific.

The explanation is not clear. Perhaps all these extracts contain substances allied to the synthetic preparations which are similar to ergot—"proteinogenous amines." Further chemical investigation of these questions is important. Other interesting experimental results which Koehler notes and promises to report in detail later are from the use of luteoglandol, enteroglandol, spermoglandol or extract from the testicle, in obstetrics. The effect was as prompt as with extract of the hypophysis. In two cases of amenorrhea the injection of secacornin was followed by the establishment of the menstrual function.

Corpus Luteum and Menstruation.

Novak[24] has studied the ovaries and the endometrium in several series of cases for the purpose of throwing light, if possible, on the normal life cycle of the corpus luteum in relation to the menstrual cycle. The study includes an effort to determine whether any histologic variations in the lutein structure can be found to explain the various menstrual disorders. Very careful and exhaustive microscopical studies were made so as not to overlook anything of significance. The very early corpus luteum was found in a few cases only, but these are important as confirming the view previously suggested by others but set forth with evidence by R. Meyer, that in the human the lutein cells are derived from the membrana granulosa. The findings are described in detail. Taken in connection with menstrual histories, they suggest that ovulation occurs in the second fourth of the menstrual cycle, a view which recently has been growing in favor. The greatest development of the corpus luteum corresponds with the premenstrual hypertrophy of the endometrium. It is not clear from Novak's findings whether the cells of the theca interna do or do not develop lutein, but it is clear that the cells of the membrana granulosa do not immediately atrophy and disappear following rupture of the follicle.

It is found that though follicles are present before and after the period of menstrual life, and develop and atrophy, apparently there is no menstruation if no corpus luteum is formed. But a study of variations in the amount of menstrual flow as indicated by the histories does not seem to correspond with variations in the amount of lutein tissue in the ovary. Undoubtedly other factors—the secretions of other endocrine glands—have to be taken into consideration.

Menopause.

Culbertson,[25] in his study of the menopause, describes the phenomena of this period and presents views, chiefly from the literature, as to their significance. Apparently the best explanation is that the cessation of function of the ovary, associated with diminution and disappearance of the internal secretion of the corpus luteum, destroys the equilibrium of the endocrinous glands. There arises a functional overefficiency of the pituitary and adrenal glands, which in turn produces an arterial hypertension. There may also be hyper- or hypothyroidism.

But the vasomotor disturbances, though generally shown by hypertension, are characterized by increase and irregularity of the pulse pressure. These may be present, even in the absence of hypertension. In practice the hypertension or increase in the pulse pressure, which Culbertson finds characteristic of the menopause, can be relieved by the use of corpus luteum, preferably from pregnant animals, as there seems to be a marked difference between the "false" and the "true" corpora in this respect. Occasionally thyroid extract may be combined with it to advantage.

The results in Culbertson's hands have been most gratifying: the hypertension has been relieved and the symptoms due to vasomotor disturbance have disappeared. Detailed reports of twenty-nine cases and a comprehensive bibliography are given. A word should be said about determining the blood pressure. It is not sufficient that a single observation be made. Culbertson repeated his observations, preferably daily, through the whole course of treatment. This gives a much better idea of the peculiar and variable picture which this condition presents. In some cases the flushes and chilly feelings were found to be closely associated with changes in vascular tension.

Ovary—Blood Supply.

Sampson[26] describes in detail the variations in the blood supply of the ovary. The method of investigation is by means of x-ray pictures of specimens injected with bismuth subcarbonate in gelatine. Considerable ingenuity was exercised in the course of his studies, and several types of ovarian blood supply are described. The important practical conclusion is that since the blood supply of the tube is so closely connected with that of the ovary, and since the type of ovarian blood supply cannot be determined at operation, the tube should not be removed at hysterectomy if the ovary is to be left. If the tube must be removed, its attachment should be cut as close to the tube as possible. Interference with the ovarian blood supply necessarily follows hysterectomy, and the better the blood supply, the better the chances of continued ovarian function.

Cystic Ovary.

The surgical treatment of "microcystic" ovaries or ovaries with "small cystic degeneration" has been one of the much-discussed questions in gynecology. At one time ovaries with this affection were removed. Then resection was practised. McGlinn[27] voices a widespread opinion that they should not be disturbed or that the small cysts should be merely punctured. He has come to this conclusion because he has seen so many patients of himself and others, who, following resection, were not relieved of their symptoms, and in whom it was found at a second operation that the microcysts had recurred.

A possible explanation for these unsatisfactory results may be found as a result of the investigations of Davis.[28] The formation of the cysts has been attributed to thickening of the ovarian connective tissue, which prevents rupture of the follicles. The usual explanation has been a chronic inflammation of the ovary, nonbacterial in origin, in the absence of peritonitis and adhesions.

Davis, using the methods elaborated by Rosenow, has made a bacteriological study of a series of sixty-two cases and finds the streptococcus viridans was present in about 50%. In some the cultures remained sterile. This indicates apparently that fibrocystic degeneration may occur without bacterial infection or that the bacteria are gradually killed and the anatomical changes persist. The gonococcus was found only twice,—one acute and one chronic ovary. The Welch bacillus was found in small numbers in 33% of the cases. The significance of this finding is not clear. Certain facts are very suggestive, and point out the need of further investigation of this group.

The not uncommon history of pelvic trouble following anginal attacks during the menstrual period; the occurrence of pelvic infection following immediately after tonsillitis; the discovery of chronic tubo-ovarian inflammation in a young woman with congenital stenosis of the cervix and the uterus, with an imperforated vagina, and the isolation of the streptococcus from the left ovary; together with the experimental production of ovaritis in animals, seem conclusive proof that hematogenous infection of the ovaries occurs, and that it may be responsible for much of the chronic ovaritis in which there is not a definite history of gonorrhea or puerperal sepsis.

Ovarian Cyst Simulating Ectopic Pregnancy.

Rubin[29] reports a number of cases in which the history pointed rather definitely to the diagnosis of early ectopic pregnancy, but in which the subsequent course, sometimes operation, did not confirm the suspicions. He discusses at length the possible theoretical explanations, with some reference to the literature. In the absence of an explanation which is certain, these cases constitute the basis of an exceedingly interesting problem, and Rubin's summary and conclusions may be quoted.

"Menstruation in married women is often delayed for periods varying from a few days to a month. During this period of temporal amenorrhea, the patients naturally regard themselves pregnant. Not infrequently, physical examination in such cases of delayed menstruation will reveal the uterus actually changed in size and consistence, thus further justifying the presumptive diagnosis of pregnancy. However, in spite of this subjective and objective evidence, the diagnosis may be left in complete doubt by the onset of the menstrual flow, which apparently differs in no way from the usual menses for that particular individual. Occasionally, in addition, there may have been found on palpation an extra-uterine mass, more or less tender, which excites the suspicion of ectopic pregnancy. This extra-uterine mass may make the impression of an enlarged cystic ovary, or be more or less elongated and simulate an enlarged, dilated tube. Pain in the lower abdomen and cramps may also be complained of. In other words, there may be present the essential points in the history and physical findings of the patient to lead to the diagnosis of an ectopic pregnancy. Occasioanlly the cystic mass may be unmistakably ruptured by the examining fingers, thus further simulating a ruptured ectopic gestation sac. Yet, neither in the subsequent course nor at laparotomy, is an ectopic pregnancy proved. Instead, a retention cyst of the ovary, varying in size from a plum to a small orange, is the only abnormal finding. This cyst may be a simple retention cyst, histologically with or without lutein cells, or it may be a genuine corpus luteum cyst. These arise either as result of an early death of an intra- or extra-uterine embryo, the subjective symptoms being due wholly to the gestation itself; or arising as the result of trauma or degenerative changes in the ovary; the corpus luteum cyst may induce secondary changes in the uterus, enlarging it, softening it, prolonging the decidual (premenstrual) phase, and inhibiting the onset of the menses.

"From an analysis of the histologic findings in the cases personally encountered, it appears that corpus luteum and retention cysts of the ovary may simulate early terminated intra- or extra-uterine pregnancy without either of these conditions actually having been present. On the other hand, it is more likely that in the majority of instances these retention cysts result secondarily through early embryonal death, whether the impregnated ovum lodged within the uterus or within the tube. The ovum is in these instances disintegrated and absorbed, and restitution (involution) takes place without the external or internal hemorrhage which we are accustomed to see in uterine or ectopic abortion. In all probability, a great many non-tragic ectopic pregnancies terminate in this way."

Carcinoma of the Ovary.

The purpose of Stone's[30] review of the literature on carcinoma of the ovary and his report of cases is to call the attention of American clinicians to the not infrequent occurrence of metastatic carcinoma in the ovary—a condition recognized for some time by European observers. The "Krukenberg" tumor is nearly always a metastasis from intestinal, occasionally from breast carcinoma. It must not be forgotten that a metastasis may be larger than the original tumor, frequently true of metastatic ovarian cancer, where the ovarian growth may control the clinical picture. A primary growth elsewhere should always be considered before instituting treatment or expressing an opinion as to prognosis. So also the possibility of metastasis in the ovary should always be kept in mind by surgeons in treating primary cancer of the breast or intestine. The route of metastasis is by peritoneal implantations or through the blood or lymphatic system. There is nothing characteristic in the secondary growths, either on macroscopic or microscopic examination. Though the adenocarcinomatous type is frequent, more often the diffuse infiltrating type is observed.

Cystitis Senilis Feminarum.

Charlton[31] uses the term "cystitis senilis feminarum" to denote a condition which he regards as analogous to the well-recognized senile vaginitis, and often found in association with it and with mild inflammation of the rectum. In the senile state all the mucous membranes become more susceptible to infection, especially if slight trauma be added. It is not described in the male, perhaps because the symptoms there are masked by those due to prostatic hypertrophy, perhaps because the changes due to childbirth are important predisposing factors.

The symptoms arise gradually, generally in elderly multiparae who give no history of previous bladder trouble, and persist with remissions during the rest of the life of the individual. They are undue frequency of micturition with tenesmus and burning. Occasionally severe acute exacerbations may cause distinct physical and mental impairment. The urine is clouded with mucus and pus, rarely blood stained. There are no characteristic bacteriological findings, though some form of bacteria is always present.

The cystoscopic picture is of chronic inflammation with edematous and bullous patches. The treatment is the best of general care and hygienic control. The only drug that Charlton has found of value is pure liquid guiacol, five to ten drops after each meal. Vigorous local treatment, as with silver salts, is out of place in patients with lowered general vitality, as is here always the case.

Bacteria in the Urine.

The use of the centrifuge for detecting the presence of bacteria in the urine has been in favor for some time. The difficulty with the ordinary method has been that in the sediment there is so much material besides bacteria, especially if pus is present, that bacteria are overlooked. Certain methods of destroying pus and detritus have been satisfactory when the tubercle bacillus has been the object of search, but they are not generally applicable. Crabtree's[32] method may be called a differential use of the centrifuge. The fluid is centrifuged for one or two minutes at lowest speed. This will sediment most of the undesirable material. The supernatant fluid (cloudy) is decanted and centrifuged until it becomes clear. In the second sediment will be found the bacteria, which may be stained in the usual manner.

This may not prove as delicate a test as the guinea pig, but it gives a rapid method, which is much needed. Among fifty-five cases, controlled by guinea pig inoculation, the method failed in one in which the guinea pig later showed tuberculosis. Under proper precautions, contaminations with the smegma bacillus can be avoided.

Cystography of the Urinary Bladder.

Kretschmer[33] presents an interesting series of cystograms with various forms of disease of the bladder. Thorium nitrate was used as a routine to distend the bladder, except in the earlier cases.

Normal cases show a sharp demarcation at the vesical neck, even with a good deal of straining. It has been claimed that with straining, the posterior urethra takes part in forming the vesical neck. Of interest is another point brought out in regard to regurgitation into the ureter. Even in some normal cases fluid escaped from the bladder and cast a shadow in the ureter. How frequently this occurs, there is at present no means of determining. In certain cases of bladder infection, fluid regurgitated through a ureteral orifice which appeared perfectly normal.

The method has many limitations, and on account of the possibility of misinterpretation, can never take the place of cystoscopic examination. It is often impossible to determine from the cystogram whether deformation of the bladder is due to something internal or to something external to the organ. For outlining the number, size and position of diverticula it is the method of choice, but it may also be of use in determining whether resection or fulguration should be employed in a certain percentage of papillary tumors.

Urinary Incontinence in Women.

Incontinence of urine in women, due to interference with the continuity or function of the sphincter vesicae, is discussed by Taylor and Watt[34] on the basis of experience at the Roosevelt Hospital. The loss of control may be complete or it may occur only on special exertion, as coughing, straining, active exercise; or it may be slight and temporary, in association with over-distention of the bladder, temporary irritability of the bladder, or times of mental or physical fatigue. In general, the greater the number of children the patient had had, the more likely was she to have urinary incontinence, though it did not always occur after ten or twelve childbirths.

Urinary incontinence may be due to lesions: (1) proximal to the sphincter vesicae, (2) in the sphincter itself, and (3) distal to the sphincter. Under (1) the authors consider any cause producing increased irritability of the bladder, for example, inflammation from any cause. In the sphincter itself, the lesion may be: (*a*) an actual destruction of the muscle from injury or ulceration; (*b*) an overstretching of the sphincter by instruments in the examination or the removal of stone; (*c*) weakening of the muscle, as in advanced age or in prolonged illness; (*d*) interference with the nerve supply in some cases of disease of the nervous system. Taylor and Watt are inclined to think that the number of cases in this last group is small.

In the third group, incontinence of urine is caused by a displacement of the neck of the bladder and urethra, usually associated with a prolapse of the anterior vaginal wall and the base of the bladder. The dragging, affecting the posterior wall of the urethra chiefly if not entirely, tends to hold the sphincter open and interferes with its proper action. Any treatment (pessary or operation) which removes the drag on the sphincter will give relief. This is the largest group of cases.

In the operative treatment, attention should be paid not only to correcting displacements of adjacent organs which affect the drag on the anterior vaginal wall, as the position of the uterus and the condition of the perineum, but in taking up the slack of the anterior vaginal wall, frequently the sphincter vesicae should be infolded.

Fistulae of Urinary Bladder.

Neuhof[35] contributes a detailed experimental and clinical study of fascial transplantation into vesical defects. There are certain applications in gynecology which may be noted here, and his work in this field includes the treatment of vesical and ureteral defects. The results were, in general, very satisfactory, yet, as Neuhof says, no new principles were employed. It is careful attention to details which is important—in fact, indispensable for success. A significant detail is the method of fixing the transplant at the defect. The edges of the transplant should be sutured to the edges of the defect, not over them, as has generally been done hitherto. Trauma should be avoided, and hemostasis should be without devitalization of tissue. Fine black silk sutures were used and preferably transplants of fascia lata. "Large vesical defects up to about one-half the bladder were replaced by fascia, with uniform success."

The functional and anatomical results were excellent. Epithelial overgrowth was complete at an early stage, with new-formed bladder wall as thick as the remainder and as resistant to internal pressure. Bone was deposited invariably at the site of the defect. In the connective tissue occupying the defect, generally replacing the transplant, was found smooth muscle continuous with the muscle of the bladder wall.

The immediate anatomic and functional results of replacement of extensive ureteral defects by tubes of fascia were satisfactory. The tube is best formed over a glass rod at a previous operation, leaving the tube and rod in place until the time of the operation on the ureter. The ultimate results on this small series of cases could not be determined, on account of the death of the dogs, one from hemorrhage and two from unknown causes. No clinical cases belonging to the group of ureteral defects are reported. But the method offers great hope of further progress.

Constitutional Factors in Gynecology.

The conception of the human body as an aggregation of individual cells led to great changes in the view of disease, and gave a great impulse to the study of structure. A vast amount of information has been acquired, largely undigested material as yet because of the failure to discover underlying and unifying principles. There have been protests from time to time against Virchow's "cellular pathology," because of its incompleteness, and Noble[36] not only adds to the protest but formulates some opinions of recent growth.

In his introductory paragraph he says: "In this contribution on the constitutional factor in gynecology and obstetrics, certain principles will be presented which are demonstrated by biologic, human clinical pathological, pathological, human antenatal pathological, comparative pathological, or by experimental teratological evidence, or by a combination of such evidence." If in that sentence, the word "demonstrated" is replaced by the word "suggested," the reader will proceed with more assurance. That the subject may be regarded as chaotic and the principles inchoate may be inferred from the text. But the point of view is one which needs emphasis, perhaps can be overemphasized with difficulty.

Disease is not an entity but "the reaction of an organism to an environment sufficiently unfavorable to produce either local or general discomfort or other disorder functions." It is also clear that the type of reaction will vary with the type of the organism, or with its constitution.

Various types of human organism have been described, but the grouping selected by Noble is perhaps the most general. The constitution of an individual depends on what he inherits and what his environment makes him, using the word "environment," in the most general sense. If the stock, or heredity, is sound and he has not been injured by environment, he is a typical individual, designated as an evolute. An individual presenting any deviation from this typical condition is called a devolute. The hereditary factors may be defective or unsound, giving a hereditary devolute; or the individual may be an environmental devolute; or if both factors are defective, a mixed devolute. The old groups of fevers, as sthenic, nervous or irritable, asthenic and mixed or nondescript, correspond to these four types of individuals and are seen in them if infection occurs.

"The diseases and morbid states which constitute gynecology fall into a few groups:

(1) Infections: (*a*) of the mucous surfaces of the genito-urinary tract, (*b*) of the peritoneum; and of the tissues, celluar, glandular, and muscular, contiguous to both.

(2) Malpositions and more especially ptoses of the pelvic and abdominal viscera.

(3) Tumors: (*a*) benign, and (*b*) malignant.

(4) Lacerations.

(5) Hypoplastic states of organs or systems of organs arrested in their development; a few from hereditary causes and most of them from environmental causes.

(6) Functional psychic and somatic disorders due to maladjustments of sexual life.

"The above grouping constitutes the whole of gynecology in principle."

"A careful and discriminating analysis of the types of disease and of morbid states which constitute the department of medicine called 'gynecology' will show either that the constitutional element is the dominant factor in these conditions or else that it enters very largely into them."

Scientific treatment, then, of all conditions except those due to traumatism, must be constitutional in character. The weight of evidence as to tumors is tending to support this view; and the facts of experimental teratology lend support to the same hypothesis.

Certain obstetrical problems are explained genetically by the application of the principles enunciated above, as many cases of sterility, certain toxic states, hypersensitive nervous conditions and certain lacerations. It is because a complete study of woman is necessary for an adequate understanding of her nature that the chief grounds for the existence of the specialty of gynecology and obstetrics are based. Incomplete study will lead, as it has led in the past, to numerous sins of commission in the way of unnecessary and useless operations.

Psychiatry and Gynecology.

Barnes[37] reviews briefly some of the literature on the relation of diseases of the genital system in the female to diseases of the mind, sums up the evidence, criticizes the arguments and theories, and presents an excellent summary of views. There is very little evidence that disease of the genital system causes disturbed mental states which may properly be called psychoses, though disturbances of the mind and of the genital system occur together often enough, in fact, about as often relatively as disease of the genital system occurs with a normal mind. While the details of his discussion cannot be given here his closing sentences are worth keeping in mind.

"The history of the development of medical knowledge is marked by the evolution and decay of fads and fancies such as we have had under consideration. The calm judgment of the majority, both psychiatrists and gynecologists, tends at present strongly to the belief that in female genital disease or dysfunction we do not find a cause of insanity, and that gynecological treatment, even where indicated, cannot be recommeneded as a cure for the psychoses."

Peritoneum and Foreign Bodies.

Cubbins and Abt[38] undertook a study of the effect of certain foreign bodies in the peritoneal cavity. Many substances have been recommended in the treatment of peritonitis and to prevent adhesions, without sufficient experimental basis. The conclusions from this present study, as reported in a preliminary article, are as follows:

Iodine is an intense irritant of the peritoneum, and favors rather than inhibits bacterial action. It will produce firm fibrous adhesions with or without any manipulation of the peritoneum. As to ether, they believe that patients recover in spite of its use, rather than because of it, and they found that the immediate mortality in dogs without manipulation was nearly 40%. In about half of the dogs which survived, adhesions had formed. Vaseline is an intense irritant to the peritoneum of a dog, and is absorbed very slowly if at all. White vaseline, lanolin and albolene seem to have a similar effect. Paraffine oil (Russian) is relatively nonabsorbable, and although far less irritating than vaseline, does not prevent adhesions. Olive oil has little effect in preventing adhesions, is absorbed slowly and has little or no irritating effect upon the peritoneum.

Posture in Abdominal Drainage.

Hill[39] discusses the effect of posture in abdominal drainage, considering the Fowler position, the prone position, and the lateral position. He holds that the posture in which the patient is placed following operation contributes materially to his recovery, and also believes the prone and the lateral positions are much superior to the Fowler. For many reasons, the prone position is the best, but the discomfort prevents its use. It is not as uncomfortable, however, as might be supposed. The head of the bed should be elevated ten or twelve inches, a pillow is placed under the lower part of the chest and another under the head, giving ample room for breathing. While drainage through the abdominal wall is now rarely used in gynecological cases it is sometimes necessary, and it is well to keep in mind the mechanical advantages of posture other than the dorsal.

Post-Operative Gas Pains.

Queen[40] reports the results in a series of one hundred and fifty abdominal operations, following the method suggested by Bonnot for prevention of gas pains. The post-operative course was uniformly satisfactory as far as distention and gas pains were concerned, and in a large percentage of the cases the bowels moved in forty-eight hours after operation without a purge. Thirty-one per cent. of the cases had been drained and emergency cases seemed to do as well as those that had been prepared.

The method (modified by Queen) is to give ten-grain doses of muriate of quinine in two ounces of water by rectum. The first dose is given immediately after operation, repeated every four hours for four doses, then every six hours for four doses. It was found that if only four doses were given (original method) gas pains would come on when the treatment was discontinued. Only one patient had to be catheterized, and backache was practically eliminated.

Vaginal Secretion.

Harada[41] has investigated the nature of the bacteriocidal property of the vaginal secretion. Since Doederlein in 1892 declared the vaginal secretion to be bacteriocidal in nature there has been considerable study of the question, in general resulting in confirmation of this point, though not all agree with the explanations given by him. On account of the diversity of opinion, Harada has carried out and described a detailed study of the vaginal secretion from the bacteriological and from the chemical point of view.

He finds that the bacteriocidal property of the vaginal secretion is gradually increased during pregnancy, but that during this period the lactic acid, sometimes present in quantities as great as .9%, suffers no increase. Though lactic acid has definite bacteriocidal properties, it is not alone responsible for the well-recognized characteristic of the vaginal secretion. Other factors are the presence of substances derived from leukocytes which occur in large numbers in the vaginal secretion in pregnancy, namely "leukin" and "cytase," or substances closely allied to them. Harada thinks, from his experimental studies, that in producing the bacteriocidal effect, the tissue juices, the lack of oxygen, the vaginal bacillus and its products are of little, if any, significance- contrary to the statements of Menge and Kroenig.

Pituitrin in Postabortion Curettement.

Furniss[42] suggests the use of pituitrin in postabortion curettement. One cubic centimeter is given hypodermatically fifteen minutes before the operation. The operation is much more easily performed, the uterus is in firm contraction and the bleeding much less. Furniss thinks the risk of uterine perforation is lessened. Should bleeding occur later, ergotole may be given, but no occasion for its use has arisen so far.

REFERENCES.

[1] Hess: Amer. Jour. Dis. of Children, xii, 466.
[2] Sullivan and Spalding: Jour. A. M. A., lxvi, 95.
[3] Norris: Surg., Gyn. and Obs., xxiii, 268.
[4] Peterson: Surg., Gyn. and Obs., xxiii, 280.
[5] Williams and Kolmer: Am. Jour. Obst., lxxiv, 638.
[6] Danforth: Surg., Gyn. and Obs., xxiv, 327.
[7] Geist: Interstate Med. Jour., xxiii, 1043.
[8] Gellhorn: Surg., Gyn. and Obs., xxiv, 37.
[9] Sherman: Surg., Gyn. and Obs., xxiv, 255.
[10] Stacy: St. Paul Med. Jour., xviii, 344.
[11] Child: Surg., Gyn. and Obs., xxiv, 329.
[12] Smith: Interstate Med. Jour., xxiii, 1037.
[13] Leonard and Dayton: Surg., Gyn. and Obs., xxiv, 156.
[14] Bancroft: Am. Jour. Obs., lxxiv, 11.
[15] Gaylord: Surg., Gyn. and Obs., xxiv, 91.
[16] Stone: Surg., Gyn. and Obs., xxiii, 248.
[17] Peterson: Surg., Gyn. and Obs., xxiii, Sept., 1916.
[18] Clark: Ann. of Surg., lxiv, 602.
[19] Pfahler: Surg., Gyn. and Obs., xxiv, 14.
[20] Frank: Surg., Gyn. and Obs., xxiii, 243.
[21] Geist: Surg., Gyn. and Obs., xxiii, 68.
[22] Frank: Surg., Gyn. and Obs., xxiv, 42.
[23] Koehler: Zent. f. Gyn., xxxix, 667.
[24] Novak: Jour. A. M. A., lxvii, 1285.
[25] Culbertson: Surg., Gyn. and Obs., xxiii, 667.
[26] Sampson: Surg., Gyn. and Obs., xxiv, 339.
[27] McGlinn: Am. Jour. Obs., lxxiii, 435.
[28] Davis: Surg., Gyn. and Obs., xxiii, 560.
[29] Rubin: Surg., Gyn. and Obs., xxiv, 443.
[30] Stone: Surg., Gyn. and Obs., xxii, 407.
[31] Charlton: Surg., Gyn. and Obs., xxiii, 371.
[32] Crabtree: Surg., Gyn. and Obs., xxii, 221.
[33] Kretschmer: Surg., Gyn. and Obs., xxii, 717.
[34] Taylor and Watt: Surg., Gyn. and Obs., xxiv, 296.
[35] Neuhof: Surg., Gyn. and Obs., xxiv, 383.
[36] Noble: Surg., Gyn. and Obs., xxiv, 98.
[37] Barnes: Surg., Gyn. and Obs., xxii, 579.
[38] Cubbins and Abt: Surg., Gyn. and Obs., xxii, 571.
[39] Hill: Trans. West. Surg. Asso., 1916.
[40] Queen: South. Med. Jour., ix, 988.
[41] Harada: Am. Jour. Med., Sc., cliii, 243.
[42] Furniss: Surg., Gyn. and Obs., 1916, Sept., p. 365.

Book Reviews.

Localization by X-rays and Stereoscopy. By Sir James Mackenzie Davidson, M.B., C.M. (Aberd). New York: Paul B. Hoeber. 1916.

The European War has brought into considerable prominence the discussion of surgical methods of locating foreign bodies in the human tissues. The increased variety of means now available for this purpose, and the application of mathematics for their employment, make possible much more elaborate procedures than have ever before been used. These have been discussed extensively in current medical literature. Sir James Davidson's monograph, carrying, as it does, the authority of one of the leading British radiologists, aims to deal in detail with the application of the roentgen ray, by photography and by stereoscopy, to the solution of the problems arising from deeply buried foreign bodies. After a preliminary description of the x-ray tube and of secondary rays and x-ray protection, the author describes successively the technique of stereoscopy, methods of rapid x-ray localization, and emphasizes particularly the cross-thread method, with the use of three coordinates, for purposes of precise localization In his preface he calls particular attention to the chapter dealing with the localization of foreign bodies in the eye ball and orbit. A series of appendices describe respectively the use of a telephone attachment in surgery, the electromagnet as an aid to localization, the method of localization from a single photograph, the rectification of the current supplied to the x-ray tube, and rules for the protection of the x-ray operator. The book is illustrated with a series of thirty-five stereoscopic figures on special plates and with other cuts in the text, making a total of sixty-one. The volume should be of great practical value, not only to military surgeons during the war, but in civil practice for dealing with industrial injuries associated with the lodgment of foreign bodies.

Focal Infection. By Frank Billings, Sc.D., M.D. New York and London: D. Appleton and Company. 1916.

This monograph, representing the Lane medical lectures delivered by the author in September, 1915, at the Stanford University Medical School, presents a study of the etiologic relation of focal infection to systemic diseases, based on the clinical experience of the Rush Medical College in affiliation with the University of Chicago and the Presbyterian Hospital for the past dozen years. The material is presented in five chapters dealing respectively with the site, etiology and other phenomena of focal infection; the transmutation and specific tissue affinities of the streptococcus-pneumococcus group of organisms; the acute diseases and the chronic diseases related to focal infection; and the methods of treating not only the focal infection but the resulting acute and chronic systemic diseases. The work concludes with a selected bibliography of fifty-seven titles. The importance of this publication will be appreciated by all who have grasped the significance of localized foci of infection as distribution centres and reservoirs of recurrent or chronic systemic diseases. The clinical application of principles here experimentally demonstrated and systematically described should, in time, have a notable effect on the general health of mankind, the prevention of disease incidence and the improvement of total human efficiency. The book is well illustrated with a series of 68 text figures.

The Diagnosis and Treatment of Heart Disease. By E. M. Brockbank. New York: Paul B. Hoeber, New York. 1916.

This little book of 120 pages is an amplification of an earlier work entitled "Heart Sounds and Murmurs, Their Causation and Differentiation." It is obviously intended as a summary to supplement instruction in the University of Manchester, England. It has the merits and the usual objections of the pocket manual. It gives the author's personal viewpoints, but at the same time omitting much material that in this country, at least, is usually considered important.

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VENEREAL DISEASES AT THE FRONT.

There have lately been discussions in private and in the press as to whether the nation is or is not bound to suppress prostitution as well as to condemn it more or less discreetly. These discussions are sometimes super-subtle. Experienced physicians will probably ask whether much is gained by holding up to public reproach one class, when, as the course of the war shows, venereal diseases are symptomatic of the trend of events in various classes connected, as Signor Salandra said recently, directly or indirectly, with the war. The debate in the newspapers and in public speeches during the month is not very satisfactory to any party concerned. The discussion leaves no one nearer a solution of the problem.

The unpleasant fact is that venereal diseases are an insidious, far-reaching and deadly evil, and their peculiar contaminations are by no means confined to professional prostitutes. It is a commonplace of medicine that syphilis, in particular, is now epidemic and familial in countries which are the scenes of immediate war. The facts about syphilis and gonorrhea at the front are thrust into the limelight by two writers expert in the social and medical aspects of venereal diseases. It is useless to gloss over these facts which are now published in the *Annales des Maladies Vénériennes* and in a pamphlet by M. Adler, Chef de la Sûreté at Lyons. Like many articles in the French language, they are brilliantly true, with a clean, direct veracity, all made up of merciless logic and unanswerable common sense. Above all, there is no confusion, no dust from a new broom, such as fools the people in popular and semi-scientific or semi-official stuff. M. Soulier, who writes the medical view, expresses with M. Adler a universal human feeling in the light of a vivid national crisis; he wishes to save the military population of France from such a fate as authorities like Gaucher see in store for it. The principal thing of which they complain is social contamination, a phrase which seems to cover every impure sexual act. Free trade, as it were, in venereal diseases has become a phase of malignant war that imperils the nation's health and future. The importance of this detail cannot be ignored. Both in the towns and near the trenches soldiers are being grievously infected with syphilis and gonorrhea. M. Soulier and Professor Gaucher do not hesitate to assert that the prevalence of these plagues is horrible. Complete figures have not yet been published, but statistics of Gaucher's clinic at the Saint Louis Hospital during the first two years of war give some conception of the serious mischief which almost certainly is now being caused by the spread of syphilis. In his address to the Academy of Medicine, he said: "Whereas, *before the war*, there were, in round numbers, 300 recent cases of syphilis in 3000 patients at our clinic, or 1 in 10, in the first months of the war we had 800 cases of recent syphilis in 5000 patients, or 1 in 6. In the eight months that followed, our statistics show 600 cases in 2300 patients, or 1 in 4. Thus, in the first sixteen months of war—from August, 1914, to the end of December, 1915—syphilis increased by more than one-third, by nearly one-half; while in the eight subsequent months—January to August, 1916—it increased by more than one-half, by two-thirds. . . . . Syphilis generally has increased by more than one-half, by two-thirds." Its effects and after-effects are comparable with those of war itself. It now takes rank with alcoholism and tuberculosis as national scourges.

M. Adler, in his *Rapport administratif,* shows that there are in France today no laws, ordinances, or decrees with regard to prostitution as a source of contamination, physical and moral. Hitherto misled by the national custom of tolerating vice, the people have made excuses for the culpable negligence of the authorities, saying that short of imprisoning every woman who approaches a military camp and absolutely cancelling all military leave, it is impossible to prevent soldiers from running the risk of infection. Since the mobilization in 1914, youthful life has been penalized by the indifference of the public whose mock-modesty has been blind, deaf and persistently wrong. Near the front, for example, the ravages of venereal diseases form a serious calamity. Great harm is done to young soldiers of 19 and 20 years of age by the display on the streets. Its daily appeal is an intensive cultivation of vice, and is particularly mischievous in the case of youths, excited by war and out of touch with their normal selves. This being the psychological atmosphere, remarks M. Soulier, imagine the coming of over-seas contingents, of hundreds of thousands of negroes, Moroccans, Somalis, Kabyles, Tunisians, Annamites, and Chinese, who bring with them ancient blood full of the syphilitic toxin which speedily makes war on the conscript's health.

How to hold in check these men of various nations who are inclined to expose themselves to infection is a problem that medical science must solve. Prophylaxis is important, but an even more important consideration is raised by the question how far it is possible to deal with venereal diseases by inspection of these troops. A committee of the Academy of Medicine, composed of Pinard, Balzer, Gaucher, Kirmisson, and Vaillard, reported that in view of the fact that infection had been greatly spread by the arrival of over-seas contingents, inspection at port and in the home camps was necessary. They look at the reasons with clearness. When these contingents arrive the population passes all at once into a febrile mood of exaltation. Drink flows, excitement multiplies itself, and the scene becomes a carnival. No one capable of discerning the spirit of such occasions can possibly fail to realize that its whole tendency is relaxing and enervating. It is in this environment that venereal diseases flare up and spread. Sir William Osler has written a strong warning against these dangers. Syphilis in seaports is a special brand. From reports that have reached us, we can endorse this statement. French physicians are endeavoring to improve the moral and sanitary conditions of seacoast towns by regular visits and inspection. But this most useful and necessary campaign has not yet received from the public and the government the frequent support which its value to the State requires.

* * *

THE RELATION BETWEEN TEMPERATURE AND PULSE CURVES.

It is no longer considered thorough to treat disease, especially acute infectious disease, whether self-limiting or not, without keeping an accurate record of temperature, pulse and respiration. But unless these records are graphically portrayed the relation between them is not easily followed. Ordinarily, both the pulse and respiration are increased with a rise in temperature, and these increases are characteristic of the febrile reaction. Except for a few conditions, however, particularly where there is meningeal irritation, the respiratory curve does not assume any significant characteristics. The pulse curve, to a lesser degree than the temperature curve, has a tendency to assume characteristic shape, depending upon the particular disease, upon the stage of the disease, on the condition of the patient and upon the presence of complications. The form of the pulse curve is more nearly an index of the condition of the patient no matter what the disease; the temperature curve is of special diagnostic significance in certain of the acute infectious diseases, such as malaria, typhoid fever, relapsing fever, septicemia and pneumonia, especially in the latter's sudden critical drop. In these diseases a view of the temperature curves is alone sufficient to establish the diagnosis of each disease. The fall of temperature to normal usually long precedes the fall of the pulse to normal rate or quality, principally because the fall of the temperature indicates merely the cessation of further reaction between the system and the infecting organism. The pulse usually remains high until the toxins have been entirely eliminated and the damage by the toxins entirely overcome. The pulse curve does not usually follow the ups and downs of the temperature curve. In so diseases the pulse is characteristically rapid, quite out of proportion to the high points reached by the temperature curves; or the pulse curve may be low, much lower in proportion even to the low points of the temperature curves. But whatever the relation between them, as long as it is maintained the disease is progressing as it should progress. There is danger only when this relationship is interrupted. In scarlet fever, for example, the rapidity of the pulse and the heights it may attain, especially in young children, is quite beyond that attained by the temperature, and if this is understood no special apprehension need be had on this account. In typhoid fever, on the other hand, the pulse curve is comparatively low, and must not of itself be given a special—favorable—prognostic significance. A close study of the temperature and pulse graphs in self-limiting diseases will disclose a fairly constant curve for each in uncomplicated cases. The pulse curve is, however, most unstable and sensitive to change. Graphic curves are especially valuable in following the progress of a disease and in warning of the onset of complications. Almost any complication, no matter how mild, will alter the course of the individual curve, but especially the relation between them. In typhoid fever, for example, perforation or hemorrhage is ushered in by a decided and an abrupt drop in the temperature and by a marked rise in the pulse rate. While normally the general direction of the two curves is alike and parallel, with either of these two complications the two curves cross each other. But a relapse would be indicated by a rise in the pulse rate long before a change in the temperature curve would be manifested.

In any event, the significant and dangerous feature in the relation between these two curves lies in low temperature and high pulse rate. In any self-limiting disease having characteristic temperature graphs a change in the shape of these curves must always act as a warning of complication or disaster. In the abstract, temperature—even very high temperature, except extreme hyperpyrexia—has little prognostic significance. The presence of temperature is merely an indication of a reaction that the human organism is making in response to the attacking infective agent. In profound debility or in terminal infections there is little or no rise in temperature because the organism has not enough vitality to respond. Indeed, where the physical and the clinical signs and symptoms show the presence of pathological processes that ordinarily call for a rise in temperature, low temperature is of grave prognostic significance. But in these cases, even though the temperature remains low, the pulse has assumed a serious mien. The rise of the pulse rate, except where it can be ascribed definitely to nervous conditions or disturbance of certain of the glands of internal secretion, is always of grave significance. Temperature alone may be caused by many innocent conditions, the pulse is always of concern. The pulse is the gauge from which is read the condition of the patient. A study of the interrelation between the temperature and pulse graphs will indicate the stage of most self-limiting diseases, the progress, the onset of complications and, very often, even the prognosis. As much, if not more, aid is afforded in the diagnosis, prognosis and treatment of the patient by the graphic record as is afforded by any other clinical or laboratory assistance—and these graphs deserve even much more attention than often is afforded them.

THEORIES OF LONGEVITY.

The quest for youth and the prolongation of life has been the goal of mankind from the earliest periods to the present day. While it is an accepted truth that "that which lives must die," it is not at all certain that death is the universal accompaniment of life. Minot calls attention to the fact that in many of the lower forms of life death does not occur, in so far as we at present know, as a necessary and natural result of life. On the other hand, some of the lower species live out their cycle of life very rapidly. On the whole, the rapidity of development influences the length of life. The more rapid the development, the more rapid the decline. It is for this reason that precocity, whether mental or physical, is not of congratulatory significance, as might appear on first impression. The limit of human life must be embraced within its particular cycle of life, and prolongation of life must be through an amplification of this cycle. The average life during the Dark Ages was 12 years. Its prolongation to the present average of about 50 years has been accomplished almost entirely through modern preventive medicine and endeavors of all sorts, but especially along the path of human welfare. No one can tell how far this limit may be extended. Neither the 100 years of Luigi Cornaro, nor the 152 of Thomas Parr, nor even the incredible age of 370 years recorded by James Easton, need be the end of the chase.

Of the many theories advanced in this connection, three stand out most prominently: those of Metchnikoff, Arnold Lorand and Montgomery. Perhaps the most romantic of these is Metchnikoff's, who ascribed old age to intestinal intoxication from retained waste products. He believed that if intestinal putrefaction could be controlled, life could be prolonged. It was for this reason that he advocated the use of lactic acid bacilli in order to retard the growth of intestinal flora. In addition, he advised intestinal lavage to maintain the intestinal toilet. There is no doubt that the effects of intestinal stasis and abnormal putrefactive changes in the intestinal canal are many, yet the dangers of these conditions and the causation thereby of autointoxication are much overdrawn. Ordinarily, not much of the intestinal matter once discharged into it is reabsorbed to cause symptoms, at least not as regards true fecal matter. Poisoning from the intestinal tract is brought about rather from non-fecal matter, matter not affected by the digestive juices and not reduced to the fecal state. Fecal matter alone in the intestinal canal does no harm. The colon is a reservoir purposed for the retention of fecal matter, and there is no known time limit after which the colon will lose its function as a reservoir. Lorand's theory of longevity has to do with the ductless glands. Because the subject of the glands of internal secretion has assumed vast proportions, this theory cannot easily be dismissed. In all probability these glands have more to do with the intricate processes of "life" than any other part of the organism. Lorand believed that atrophy and degeneration of the ductless glands—of the thyroid, the adrenals, the pituitary gland, the ovaries and the testes, but especially the thyroid—was the direct cause of old age. He points to the aged appearance of the myxoedematous and the cretenoids as suggestive of this opinion. Undoubtedly the maintenance of the physiological balance between these glands is productive of better health and longer life, but whether these glands are the sole arbiters of the question of length of life must needs still be an open question. The last of these three theories of longevity has to do with the excretory functions. "The limit of life is a matter of excretion." But this is platitude, since it is obvious that life cannot continue when the excretions cease and is limited when they do not functionate properly. Montgomery's theory is merely an amplification of Metchnikoff's, since the latter harps only on the one channel of excretion the intestines. Instead of a mere autointoxication, Montgomery goes further to say that the retained waste matter transforms parenchymatous tissue into fibrous tissue and thus shortens life. There is no doubt that the degenerative diseases, as they affect particularly the excretory functions, are the chief factors that keep the mortality high and life short in the face of the great reductions in epidemic diseases. While the latter have been reduced, the former have increased enormously. Were this element eliminated there is no question but that life would be very much lengthened—to what degree no one can say. In the reduction of the degenerative, sclerotic diseases must be found the "fountain of youth." But to whatever theories of longevity one subscribes, the fact remains that the prolongation of life is a problem for the scientist, for the hygienist and for the welfare worker. Preventive medicine, the simpler and happier life, better sanitation, may increase the span of life even beyond the fondest hopes.

* * *

MEDICAL NOTES.

Hospital Bequests.—By the will of the late Mary Warden Harkness of New York, Morristown Memorial Hospital and the Germantown Dispensary and Hospital each receive the sum of $100,000.

Smallpox in Maine.—The epidemic of smallpox which centered in Gardiner, Me., is believed to be checked. There have been reported between 75 and 100 cases, all in mild form. The schools reopened on November 19th, and all pupils were vaccinated. Churches and public libraries were closed and moving picture houses requested to suspend. Fort Fairfield reported 21 cases and Presque Isle, three

WAR NOTES.

Industrial Hygiene in War Time.—At a meeting of the Massachusetts Association of Boards of Health, held recently at Pittsfield, Dr. W. Gilman Thompson of New York made an address on industrial hygiene in war time.

In its special provinces the Council for National Defense has taken advantage of the ex perience of Dr. Thompson in the consideration of two problems: the planning of dispensaries for the treatment of industrial diseases, to be located near groups of large plants; and, second, the formulation of health standards for munition factories.

Dr. Thompson recommended the frequent periodic examination of all workers.

"Despite the best of conditions, some poisoning may occur, but, on the other hand, in the group of high explosives now in favor, TNT and its relatives, the symptoms are well defined and easy of observation. Owing to care in this matter and the enforcement of examinations, no fatal cases of TNT poisoning have been known at the duPont works, although in the beginning of the war such deaths were in considerable numbers in the factories abroad.

"Milder forms of the same kind of poisoning are to be noted in the peace industries allied to powder making, namely, the dyestuff manufacture. From its readiness to absorb through the skin, the human organism is liable to a good deal of trouble when it comes to handling the anilines. That these industries will be subject to enormous expansion here when attention can be given to them is without question. The study of such industrial poisons is, therefore, today a most important problem, for, in the absence of antidotes, the most reliable defense must be prevention, and this can be accomplished through the education of the employees to the dangers."

New Government Hospital.—The Little Wanderers' Home building on West Newton Street, Boston, now the property of the Salvation Army, will be taken over by the Government to be used as a hospital for soldiers and sailors suffering from insidious ailments. The doctors on the staff of the dispensary connected with the social centre and nurses from the Salvation Army Home for Nurses of Dorchester have offered their services free.

Appointment for French Welfare Work.—Dr. Maynard Ladd, physician-in-chief of the hospital for children of the Boston Dispensary, has been appointed associate director of child-welfare work in France, which is one of the activities of the Red Cross. His assistant, Dr. Robert Sharpe, will accompany him. Dr. Elmer W. Barron will assume charge of the work at the Boston Dispensary.

Gift of Reconstruction Hospital by Elks.—It is announced that the Elks have made a gift of $250,000 to the Government to build the reconstruction hospital on Parker Hill, Boston. The gift has been accepted and the Government will construct a complete unit of twin ward hospital buildings, vocational workshops, barracks, mess hall and post exchanges. This hospital will be the first of its kind to be erected.

Shortage of Ambulances.—Lt.-Col. Brooks of the Massachusetts State Guard has pointed out the great shortage of ambulances in this State, owing to the demands of the war. In the event of an extensive fire or riot the State Guard would be greatly handicapped by this shortage. At a conference of Knights of Pythias deputies, held in Boston, at which Lt.-Col. Brooks made this statement, a fund was begun to provide for this deficiency.

Address by Sir Berkeley Moynihan.—The New York State Committee of the Council of National Defense, on November 8, gave a dinner in honor of Sir Berkeley Moynihan. Major George W. Crile of Cleveland, O., director of United States Base Hospital No. 4, was also a guest of honor at the dinner. In discussing the war, Sir Berkeley Moynihan made these pertinent remarks: "Germany is stronger today than ever before. She says she can put in the field from 1,000,000 to 1,500,000 fresh men every year. She is ruthless and implacable and most efficiently organized. Germany is going strong. She will not be conquered from within; she must be conquered from without by you and us. America must prepare herself for a war that is long and arduous. I am asked how long the war will last. I will say for America that the war for her will have just begun when every man of military age will have offered his life to his country; when your wealth, your souls and your honor have been offered; when you have mourned your honored dead by the hundreds of thousands."

War Relief Funds.—On Nov. 17 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$297,501.59
Armenian-Syrian Fund	248,919.07
Surgical Dressings Fund	137,400.26
Permanent Blind Fund	128,122.99
Metropolitan Red Cross Fund .	88,689.75
French Phthisis Fund	70,337.21
Italian Fund	51,796.94
War Dogs' Fund	1,903.25

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Nov. 17, 1917, the number of deaths reported was 223, against 200 last year, with a rate of 15.06, against 13.72 last year. There were 32 deaths under one year of age, against 32 last year.

The number of cases of principal reportable diseases were: diphtheria, 109; scarlet fever, 33; measles, 82; whooping cough, 31; typhoid fever, 5; tuberculosis, 41.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 5; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 7; whooping cough, 1; typhoid fever, 1; tuberculosis, 27.

Included in the above were the following non-residents: diphtheria, 5; tuberculosis, 6.

Hospital Bequests.—By the will of the late Richard B. Sewall of Boston, each of the following institutions receives the sum of $25,000: Massachusetts Charitable Eye and Ear Infirmary, Massachusetts General Hospital, and the Children's Hospital. The Convalescent Home of the Children's Hospital at Wellesley receives $15,000.

The Cancer Commission of Harvard University.—Until further notice meetings will be held under the direction of the Cancer Commission every Friday in the faculty lunch room of the Harvard Medical School. One or more subjects, followed by discussions, will be presented during the luncheon. The first speaker will begin promptly at 12.30 o'clock. No formal announcement of the program will be made by the committee and no notice will be sent out, but all who are interested are invited to attend and take part in the discussion. Luncheon will be served *à la carte*.

Meeting of Medical Examiners.—The Massachusetts Medical Service Association held its semi-annual meeting on November 8, at the home of its president, Dr. John Hall Smith, Cambridge. The subject under discussion was the voluntary aspects of industrial health and accident insurance.

Springfield Academy of Medicine.—The November meeting was held at 137½ State Street, Springfield, on November 13. Dr. W. R. MacAusland of Boston spoke on "Mobilization of Stiff Joints by Arthroplasty."

Academy Note: The teaching courses will begin early in January.

Dr. L. D. Chapin, *Secretary*.

The Massachusetts Medical Society.

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Essex North, T. N. Stone, M.D., Haverhill.
Essex South, H. P. Bennett, M.D., Lynn.
Hampden, Laurence D. Chapin, M.D., Springfield.
Hampshire, E. E. Thomas, M.D., Northampton.
Middlesex South, William C. Hanson, M.D., Belmont.

Worcester District Medical Society.—The last regular meeting of the Society was held on Nov. 14, 1917, at 4.15 p.m. Subject: "Health Insurance."

Because of its vital interest to us as physicians and taxpayers the officers ventured to devote another meeting to this matter, now being studied by a recess commission of the Massachusetts Legislature.

Heretofore men of our profession have been leaders in the political and social thought of their communities and it is becoming to us as citizens now, in the face of impending legislation of a character so radical that it must needs profoundly affect our economic position, to inform ourselves fully in the principles involved and see to it that such information reaches the general public.

Whatever the final outcome of the present agitation for and against these measures, it is our duty to protect our community and ourselves from possible disaster by exerting all the weight of our influence on the side of just, sane and workable provisions—worthy of Massachusetts tradition.

To the end of securing information from different points of view, the officers invited the presentation of:

1. That of Union Labor—by Mr. William H. Haskins of Central Labor Union.
2. That of the Manufacturer—by Mr. Harry W. Goddard of Spencer Wire Co.
3. That of the Physician—by Dr. F. W. Anthony, Haverhill, of the M. M. S. Com. on Health Insurance.
4. General Discussion.

REVISED LIST OF PHYSICIANS IN MILITARY SERVICE OF THE UNITED STATES OR THE ALLIES.

U. S. Army: Dr. Joseph O'Connor, Worcester; Dr. Howard Beal, Worcester; Dr. Edw. B. Bigelow, Worcester; Dr. Frank W. George, Worcester; Dr. Roger Kinnicutt, Worcester; Dr. E. B. Simmons, Worcester; Dr. William E. Denning, Worcester; Dr. Willard Lemaire, Worcester; Dr. James J. Goodwin, Clinton; Dr. Chester C. Beckley, Lancaster; Dr. Roger Schofield, Worcester; Dr. Merrick, Lincoln, Worcester; Dr. George C. Lincoln, Worcester; Dr. E. S. Phelan, North Brookfield; Dr. R. S. Newton, Westboro; Dr. William J. Fay, Worcester; Dr. A. K. Yoosuf, Worcester; *Dr. James V. May, Worcester; Dr. Samuel C. Gwynne, Worcester; Dr. Harry P. Cahill, Worcester; Dr. Israel Lurier, Worcester; Dr. Donald Gilfillan, Worcester; Dr. D. F. O'Connor, Worcester; Dr. Homer Gage, Worcester.

U. S. Navy: Dr. Gilbert Haigh, Worcester; Dr. Louis Johnson, Worcester; Dr. Thomas Courtney, Worcester; Dr. Joseph L. Lannois, Northboro; Dr. Winthrop Adams, Worcester.

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* Honorably discharged.

English Army (Harvard Unit): Dr. Kendall Emerson, Worcester; Dr. Oliver Stansfield, Worcester; Dr. Stanley Bridges, Worcester; †Dr. George Watt, Worcester.

English Hospitals: Dr. Albert O. Raymond, Worcester; Dr. William H. MacKay, Worcester.

American Ambulance (Paris): Dr. W. Irving Clark, Worcester.

Commissioned but not yet called to active duty; Dr. George F. Little, Uxbridge; Dr. Willard P. Stapleton, Worcester; Dr. Frank T. Oberg, Worcester; Dr. H. L. Simmons, Worcester; Dr. Charles Salmon, Worcester.

Commissioned as medical members of local selection boards for the National Army: Dr. James C. Austin, Spencer; Dr. Edw. W. Balmer, Whitinsville; Dr. J. Arthur Barnes, Worcester; Dr. Frederick Bryant, Worcester; Dr. John F. Harkins, Worcester; Dr. Ernest L. Hunt, Worcester; Dr. William C. McKibben, Worcester.

Commissioned as Medical Officers of Massachusetts State Guard: Dr. L. F. Woodward, Worcester; Dr. C. A. Sparrow, Worcester; Dr. Roy J. Ward, Worcester; Dr. Frank L. Magune, Worcester; Dr. George F. H. Bowers, Worcester.

The Medical War Committee invites information to supplement or correct this list. Doctors joining the Colors should notify the Committee and indicate their wishes with regard to sharing the fees derived from their patients.

M. F. Fallon, *President*,
E. L. Hunt, *Secretary*.

Essex South District Medical Society.—Dr. J. B. Blake was the guest of the Lynn Medical Fraternity on November 6. Subject: "Informal Talk on the Medical Aspects of the War."

The next meeting of the Essex South Society was held in Beverly, November 20. Dr. F. B. Lund was the guest.

PHYSICIANS IN GOVERNMENT SERVICE NOV. 1, 1917.

U. S. Army Medical Reserve Corps: N. P. Breed, Lynn; H. L. Davis, Lynn; E. M. Dolloff (Homo.), Lynn; L. M. Hassett, Lynn; C. L. M. Judkins, Lynn; W. V. Kane, Lynn; G. H. Kirkpatrick, Lynn; W. F. Lemaire, Lynn; L. H. Limauro, Lynn; E. A. Merrill, Lynn; O. C. Spencer (Homo.), Lynn; J. W. Trask, Lynn; DeW. S. Clark, Salem; E. A. Rushford, Salem; G. C. Parcher, Saugus; A. P. Chronquest, Danvers; P. P. Johnson, Beverly; H. E. Sears, Beverly; G. A. Stickney, Beverly; S. W. Mooring, Gloucester.

Canadian Army: W. G. Shepard, Lynn.

U. S. Navy Medical Corps: J. R. White, Lynn.

U. S. Navy Medical Reserve Corps: G. W. Eastman, Lynn; R. W. Mathes, Lynn; L. R Chisholm, Salem.

List subject to correction

H. P. Bennett, *Secretary*.

Franklin District Medical Society.—The regular bi-monthly meeting was held at the Mansion House, Greenfield, on November 13, at 11.15 o'clock. Program: "Impressions from the Western Front," by Dr. Philip Kilroy of Springfield.

Dr. J. B. Blake of the State Committee, Council of National Defense, was present and made an address.

H. N. Howe, M.D., *President*,
F. A. Millett, M.D., *Secretary*.

Suffolk District Medical Society.—President Vickery has appointed the following committees from Suffolk District:

Committee to consider the question of relief of families of medical men in the service: Chairman, Dr. Henry Jackson, Dr. Gerald Blake, Dr. G. S. C. Badger, Dr. T. W. Harmer.

Committee to study methods of reëducation of disabled individuals and the results attained in this direction: Chairman, Dr. Frederic J. Cotton, Dr. Andrew Cornwall, Dr. E. H. Risley, Dr. Otto Hermann, Dr. Robert Soutter, Dr. W. E. Paul, Dr. Lloyd Brown, Dr. H. F. Day, Dr. R. H. Vose, Miss Ida Cannon.

Gilbert Smith, *Secretary*.

Obituary.

SILAS DEAN PRESBREY, M.D.

Dr. S. D. Presbrey, an ex-president of the Massachusetts Medical Society, died at his home in Taunton, October 23, 1917.

Silas Dean Presbrey was born in Taunton Oct. 19, 1838. He was educated in the public schools of Taunton and at Harvard College, from which he was graduated in the Class of 1860. He took high rank in scholarship and was elected a member of the Phi Beta Kappa. Later—in 1863—he received the degree of A.M. from Harvard.

Choosing medicine as his profession, he entered the Harvard Medical School where he graduated in 1865.

Dr. Presbrey served as resident undergraduate physician at Tewksbury in 1864-65, and then returned to Taunton to enter upon his life work as a general practitioner of medicine. Here he was appointed city physician—the first holder of that office.

In July, 1877, he was made a medical examiner and filled that position faithfully and conscientiously until recent years when he was obliged to relinquish it because of failing health. He was one of the founders, and, at one time, president of the Massachusetts Medico Legal Society.

Dr. Presbrey became a member of the Massachusetts Medical Society in 1865, and was always an indefatigable worker in its interests.

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† Enlistment expired

In his mind no physician measured up to the right standard unless he attended all the meetings of the Society to which he had rightful access. As a member of the Committee on State and National Legislation, Dr. Presbrey gave largely of his time and influence. His election as President of the Massachusetts Medical Society, in 1908, came to him as a grateful recognition of his services to this Society, and was always regarded by him as the highest honor of his long professional life.

He was also, for many years, a member of the American Medical Association and of the American Academy of Medicine, of which he was, at one period, a Vice-President.

In addition to the absorbing demands of a large practice, Dr. Presbrey made opportunity for many local activities of substantial value. During his medical studies he served for a time as principal of the Taunton High School. Here he elaborated his knowledge of the classics so well founded while at Harvard, and to his later years he delighted in his recollections of Latin and Greek, always maintaining that on them was built the structure of all adequate education.

From 1876 until his death he was a member of the Board of Water Commissioners of the City of Taunton, administering a political office in common with his associates, in such manner that there has been only praise for the conduct of that office.

As to many physicians in the smaller communities, there came to him membership upon the School Committee for many years.

He was a thirty-second degree Mason.

In 1888 Dr. Presbrey was instrumental in the founding of Morton Hospital, Taunton, and served as the president of its board of trustees until impaired health forced his retirement a few years ago. He was at first visiting, and later, consulting, physician to that institution, and through the influence of his strong personality, did much to elevate the professional standard both for his associates on the staff and for the many nurses who came under his instruction.

Devoted as he was to the exacting tasks of a general practice, Dr. Presbrey was wise enough to take the relaxation and rest of an occasional vacation. He was a good shot, but in fishing he found the greater pleasure.

A keen observer of men and things, through extensive travel both on this continent and across the sea, he enriched his knowledge and stored up experiences that he looked back upon with great satisfaction, particularly when lessened vision shut him off, in a measure, from many of his activities.

On Oct. 1, 1863, Dr. Presbrey married Sarah Williams Briggs, who died several years ago. Of the three daughters born to them, one died while a junior at Smith College; the other two have been the thoughtful comrades of their father to the end.

Dr. Presbrey was a man of fine ideals. He impressed himself upon his generation, whether practising his profession or meeting men in the various affairs of life. His standards were fixed high and he lived up to them. More than that, he expected equally high standards from his associates in the profession and he made his demand known with no uncertain voice.

Many a physician, often, perhaps, without the knowledge, has been kept true through the influence of his upright example.

May that influence long endure as he rests from his labors!

ARTHUR MARTIN CLAPP, M.D.

Arthur Martin Clapp, M.D., was electrocuted while testing a high-frequency coil in his office at Springfield, Mass., Oct. 31, 1917, aged 41 years.

Dr. Clapp had purchased the x-ray apparatus of the late Dr. E. M. Brown, and was testing out the coil when he received approximately 5,000 volts—the full load of the street line connection.

He was a native of Northampton, the son of Martin L. and Frances A. Clapp, and was born March 1, 1876. Going to school in Northampton, he went on to Amherst College and graduated in 1898. Then he studied medicine at the Albany Medical College and at Harvard Medical School, receiving his M.D. from the latter in 1902. After serving as interne at the Springfield Hospital, he practised at Ware, Mass., for six months and then settled in Springfield. There he was a member of the staff of the Springfield Hospital and physician to the Hampden County jail. He was a member of the Springfield Academy of Medicine, Springfield Clinical Club, the Massachusetts Medical Society and the American Medical Association.

In 1905 Dr. Clapp married Edith W. Bates of Northampton, and she and one son survive him.

Miscellany.

UNITED STATES CIVIL SERVICE EXAMINATIONS.

December 5, 1917.

MEDICAL INTERNE, ST. ELIZABETH'S HOSPITAL.

The United States Civil Service Commission announces an open competitive examination for medical interne, for both men and women, on December 5, 1917. A vacancy in St. Elizabeth's Hospital, Washington, D. C., at $900 a year, and future vacancies requiring similar qualifications, at this or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The positions are tenable for one year, and pay $75 a month and maintenance. During the year, however, a postgraduate course in mental and neurological diagnostic methods is given, an examination is held, and promotions to the next grade, junior assistant physician, are made. Beyond this there is regular advancement for men whose services are satisfactory. St. Elizabeth's Hospital has over 3,000 patients and about 800 employees to care for. In addition to the general medical practice offered, the scientific opportunities in neurology and psychiatry are unsurpassed.

Applicants must show that they are graduates of a reputable medical college or that they are senior students in such an institution and expect to graduate within six months from the date of this examination. The names of senior students will not be certified for appointment in the event they attain eligibility in the examination until they have furnished proof of actual graduation.

Applicants must not have graduated previous to the year 1915 unless they have been continuously engaged in hospital, laboratory, or research work along the lines of neurology or psychiatry since graduation, which fact must be specifically shown in the application.

Applicants must be unmarried.

Age, 20 years or over on the date of the examination.

No sample questions of this examination will be furnished.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination, as given at the head of this announcement, should be stated in the application.

PATHOLOGIST (MALE), FREEDMEN'S HOSPITAL.

The United States Civil Service Commission announces an open competitive examination for pathologist, for men only, on December 5, 1917. A vacancy in Freedmen's Hospital. Washington, D. C., at $2,000 a year, and future vacancies requiring similar qualifications, at this or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

As only one application was filed for the examination of October 3, 1917, qualified persons are urged to apply.

Applicants must show that they have had at least one year's experience in a pathological laboratory after graduating from a medical college of recognized standing, and that they are able to make all kinds of pathologic examinations, x-ray included, and reports thereon.

Statements as to training and experience are accepted subject to verification.

Applicants must have reached their twentieth birthday on the date of the examination.

Applicants may be examined at any place at which this examination is held, regardless of their place of residence, and become eligible for appointment to Freedmen's Hospital and other branches of the non-apportioned service; but those desiring to become eligible for appointment in the apportioned service in Washington, D.C., must be examined in the state or territory in which they reside and have been actually domiciled in such state or territory for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C. Applications should be properly executed, excluding the medical certificate, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

SOCIETY NOTICES.

Boston Medical Library in Conjunction with the Suffolk District Medical Society.—Surgical Section meeting, John Ware Hall, Wednesday, November 21, 1917, at 8.15 P.M. Lieut. Col. Keenan of Montreal, surgeon to the Princess Patricia Regiment, will speak on War Surgery.

Daniel Fiske Jones, *Chairman Surgical Section*,
Wyman Whittemore, *Secretary Surgical Section*.

East Boston Medical Society.—The East Boston Medical Society will meet on Friday night, November 23, at eight o'clock, at Walcott's Hall, Central Square, East Boston.

Dr. Horace E. Bragdon will speak on "Operative Surgery and the General Practitioner" and Dr. James H. Strong will speak on "The Examination of Recruits for Military Service."

Three members of the society are enrolled in the Medical Reserve Corps, Dr. Frank Bishop on active duty, and Drs. Salermo and Schwartz on the waiting list.

Dr. Robert Bonney has been appointed assistant in practical therapeutics at the Boston City Hospital.

The majority of the members of this society are also members of the Massachusetts Medical Society, and extend a cordial invitation for the medical profession to attend the meeting.

J. Danforth Taylor, *Secretary.*

The Norfolk District Medical Society.—A stated meeting of the Society will be held at the Roxbury Masonic Temple, 171 Warren Street, Tuesday, November 27, at 8 P.M.

Business.

Communication: Normal Serum Therapy,
Timothy Leary, M.D., Francis P. McCarthy, M.D.,
Joseph H. Shortell, M.D.

Bradford Kent, M.D., *Secretary.*

Boston Association for the Relief and Control of Tuberculosis.—The fourteenth annual meeting of the Association will be held at 3 Joy Street, on November 22, at 3.30 P.M. Subject: Consumptives' Hospital Department and Industrial Nursing.

RECENT DEATHS.

John Zebulon Currie, M.D., died suddenly of heart disease while in his automobile in Arlington, November 10, 1917, aged 70 years.

He was born in Fredericton, N.B., January 4, 1847; was graduated from Harvard Medical School in 1873, and received a degree from the University of Edinburg in 1874, and S.B. and Ph.D. from the University of New Brunswick. He practised in Fredericton until 1893 when he moved to Cambridge, where he was physician to the Home for Aged People. In New Brunswick he had been chief health officer of the Province and secretary of the board of health. Dr. Currie was a Fellow of the Massachusetts Medical Society and of the American Medical Association. He is survived by his widow and one son.

The Boston Medical and Surgical Journal

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The Massachusetts Medical Society.

SECTION OF MEDICINE.

JUNE 12, 1917.

THE METHOD OF ELECTROCARDIOGRAPHY AND THE ELECTROCARDIOGRAM IN HEALTH.

BY HORATIO B. WILLIAMS, M.D., NEW YORK.

[From the Department of Physiology, College of Physicians and Surgeons, Columbia University, New York.]

FROM time immemorial it has been commonly known that the continuance of life depends upon the constant beating of the heart. The vital necessity for action of this organ has always excited the liveliest interest in everything pertaining to its function. Its anatomy was known to the ancients, but the beginnings of accurate knowledge of its function may be fairly said to date from the work of Harvey. During the nineteenth century, the methods of the physiological laboratory applied to study of the circulation resulted in the amassing of facts of fundamental importance, but it has long been realized that disease of the human heart produces modifications of its action such as we are often unable to duplicate by the methods of the laboratory. A better understanding of the clinical disorders of the heart is certain to result in more thorough knowledge of its normal function and more rational treatment of its disorders.

The first clinician who applied the methods of the laboratory persistently and with result to the clinical study of cardiac disorders was James MacKenzie. You all know his work and the effect it has had upon our outlook on diseases of the circulation. Great as are the advantages of being able to study the time relations between auricles and ventricles by the graphic pulse method, there was still felt the need for more intimate knowledge of the mechanism of the heart.

For many years it has been known to physiologists that every activity of living substance is accompanied by electrical changes, and that study of the electrical phenomena yields information not readily obtained in other ways. To use the electrical method it was necessary to expose the organ under investigation and attach electrodes directly to it. Even after Waller discovered in 1887 that the action current of the human heart was sufficiently strong so that a fraction of it, tapped off from the surface of the body, would operate a delicate instrument, the electrical method of study was not applied to the human heart except by a few men working in laboratories, because of the difficulties of working with the instruments then available and also because these instruments gave results which required complicated correction methods.

In 1903, Einthoven, professor of physiology at Leyden, described a new electrical instrument, his string galvanometer, very sensitive and extremely quick in responding to electrical currents of brief duration. With the advent of this instrument it became possible to apply the method of studying the action current of the heart as a clinical routine. The first publication of clinical results with this instrument attracted instant attention, not only because of the important nature of the new information, but also because they were obtained by connecting patients at the hospital in Leyden through wires with an instrument in the physiological laboratory over a kilometer away.

Einthoven's instrument is beautiful in its simplicity as well as in its performance. It consists of a powerful electromagnet with a narrow air-gap between the poles. Stretched vertically in this air-gap is a fine wire of extreme lightness. This is usually made by coating a fiber of quartz glass with a thin layer of metal, and the diameter of the wire so made is about one third that of an average human red blood corpuscle. When this wire is traversed by a feeble current a magnetic field is set up around it, and though very feeble, this field reacting against the powerful field of the electromagnet results in a curving of the wire in a direction at right angles to the field of the electromagnet. In order to make this slight motion evident without weighting the wire with any device for magnifying the motion, as is done in most electrical measuring instruments, each pole of the magnet is perforated in the middle, light is admitted through one opening and a microscope inserted in the other magnifies both the wire and its motion. By illuminating the wire with an arc lamp and projecting its magnified shadow on a screen, the movement can be readily seen. If the shadow is projected through a slit in the wall of a tight box containing a moving photographic film, the movements of the shadow can be recorded on the film, which when developed will show a wavy shadow corresponding to successive positions of the shadow of the wire or "string."

To record the human electrocardiogram with such an apparatus it is necessary merely to connect two points on the surface of the body with the ends of the fine wire by means of suitable electrodes. Einthoven found it convenient to use the extremities as points from which to lead off the current, and employed three pairs of leads: right arm to left arm, right arm to left foot and left arm to left foot.

These for brevity he called leads one, two and three. These leads are universally used and designated in this manner.

It should be remarked that, with suitable accessory apparatus, the sensitiveness of the galvanometer is so regulated that any observer can duplicate the results obtained by another upon the same subject even though they do not use the same apparatus.

It is not possible to speak of a normal form of electrocardiogram, as the curves from different normal people differ quite as much as their facial characteristics. However, the curves in health do not depart from a type which is readily recognized. This typical curve shows three main deflections,—a small rounded elevation, followed by a sharp peak, which is again followed by a rounded elevation larger, as a rule, than the first small one. There are also some lesser deflections less constant and of less significance.

On examining the curve in a patient with heart block we can see at once that the first small rounded eminence is caused by the action of the auricles, the sharp peak and the second elevation being both due to the action of the ventricles.

It may further help us to understand the relation of events in this electrical curve to the heart cycle, as we ordinarily understand it, if we look at a record of the electrocardiogram taken simultaneously with a graphic record of the sounds of the heart. You will see that the first small elevation precedes the first heart sound. The sharp peak begins very shortly before the first sound and the second elevation of the ventricular complex ends just as the second sound of the heart is heard. You have, doubtless, already noticed that we have here in a single curve the means of knowing when the action of the auricles begins and when that of the ventricles follows, so that many circulatory phenomena whose nature we can determine by these time relations can be understood at a glance without the necessity of careful measurement and comparison of two curves, as is necessary in the polygraphic method.

The more important service which the method of electrocardiography renders us will be appreciated from consideration of the changes from the typical form which occur in diseases of the heart. This phase of the subject will be discussed by other speakers. In closing I wish to emphasize a single point. The string galvanometer is an instrument of precision and if used with proper care its results are unimpeachable.

Not so, however, with the interpretation. We have still much to learn and are finding that more than one interpretation may be possible for some of the changes seen.

It behooves us therefore to regard this method, beautiful as it is, as merely a link in the diagnostic chain and to secure and weigh every available scrap of evidence before arriving at a conclusion. By so doing we shall increase our knowledge of the circulation and improve the precision of our diagnoses without falling into those pitfalls which await the enthusiast who puts all his faith in a single method and is led to neglect elementary facts which lie easily within his grasp.

The Significance of Arrhythmias and Systolic Murmurs in Relation to Cardiac Efficiency.

By Henry A. Christian, M.D., Boston.

[From the Medical Clinic of the Peter Bent Brigham Hospital.]

Just at the present time an increased importance attaches to the interpretation of abnormalities in heart sounds and heart rhythm because, in addition to our regular work in diagnosing and treating disease, we are to be called upon to examine many young men, to determine whether they are likely to be able to undergo the strain and exertion of military duty. Some cardiac abnormalities are thoroughly consistent with vigorous muscular strain and so need not debar from active service. Others are so regularly indicative of cardiac inefficiency, even though the inefficiency at the time may not be in evidence, as to justify exclusion as unfit. Some hearts are incapable of much extra work though sounds and rhythm are essentially normal.

A purely objective physical examination is not a safe guide in every case. Past history and symptoms not infrequently give the decision as to what interpretation should be placed on certain abnormalities.

Of abnormal cardiac sounds murmurs have had most consideration. Diastolic murmurs, whatever their intensity, location, and propagation, deserve great consideration. With almost no exceptions, diastolic murmurs indicate organic lesions of serious import, and finding a definite diastolic murmur alone is sufficient reason for considering an individual as probably unacceptable for a service requiring severe physical strain, continuing over a considerable period of time.

As we encounter diastolic murmurs, with very few exceptions they indicate mitral stenosis or aortic insufficiency or dilatation of the pulmonic ring. Mitral stenosis is practically always indicative of an organic change in the valve, which will progress and which will lead eventually to cardiac insufficiency either from the mechanical narrowing of the valve orifice or from myocardial disturbances or both.

Many of the patients with mitral stenosis eventually develop auricular fibrillation, and as we will see later a large proportion of patients incapacitated by auricular fibrillation before 40 give the physical signs of mitral stenosis and an antecedent history of rheumatism.

Aortic insufficiency is almost without exception the result of organic change in valve cusps or in aortic wall. In young adults the former is usually the result of rheumatism, the latter of syphilis. Both are serious conditions badly handicapping the heart, with eventual hypertrophy, dilatation and myocardial insufficiency. Dilatation of the pulmonic ring causing the Graham-Steele murmur, though it may be transitory, is indicative of serious cardiac disturbance.

As diastolic murmurs are important, conversely systolic murmurs in young adults are unimportant. A safe rule to follow with systolic murmurs in the apex and left basal regions is to place no significance on them unless accompanied by other evidence of cardiac disability. It makes no odds what the quality of the murmur nor whither it is propagated, this rule is to be followed. It is not possible to distinguish a systolic murmur as due to organic valve lesion by harshness of murmur or by its propagation to axilla, etc.; often soft murmurs indicate more serious disturbance than loud. Were it not for the importance of diastolic murmurs, auscultation well might be omitted in examining young adults, for the systolic murmur *in itself* is of no significance.

It is very infrequent with systolic murmurs at the apex or in the left basal region, unaccompanied by a diastolic murmur, to find at autopsy any evidence of chronic endocarditis of the mitral valve. In older people very often the valve edge is thickened, but an actual organic mitral insufficiency without stenosis is a rare lesion and its possibility practically may be excluded from differential diagnosis. The more hearts I observe in life and then see at autopsy, the stronger grows my conviction on this subject. If a heart is not obviously enlarged, or if auricular fibrillation or pulsus alternans do not exist,—and both of these latter are rare in young people,—the chances that a systolic murmur, without a diastolic murmur, is of any import, are but slight. If there is no past history of rheumatism and the patient experiences no definite dyspnea, the murmur is negligible, and here, again, even if it is harsh and loud.

The views just expressed in regard to systolic murmurs are in full accord with those of Thomas Lewis who has large experience in dealing with British soldiers, being in charge of a special hospital for the study of heart conditions in soldiers. Lewis expresses his views as follows:

(a) "Systolic murmurs at base or apex indicate valvular lesions only exceptionally; there is no conformity of opinion as to the character or conduction of systolic murmurs indicating valvular lesion.

(b) "The extent of mitral valve damage which produces a systolic murmur alone is relatively slight; the disease is often limited to the valve, the heart muscle which is the essential part of the organ being wholly undamaged.

(c) "Patients who are invalided on the ground of systolic murmurs *alone* are subsequently found *when tested* to be fit for active service in nearly all instances. A large number of men who present such murmurs are known to have passed the most severe ordeals of active service without accident.

(d) "If a group of patients who present no murmurs and a similar group in whom systolic murmurs exist are tested in respect to their capacity for work or active service, no difference is to be found in the capacity of the two groups."

His conclusion is: "The presence or absence of systolic murmurs is of no value in estimating the soldier's capacity for work. This practical conclusion holds, irrespective of the character, conduction or point of maximal audibility of the murmur in question."

Some abnormalities in the heart sounds are of much significance. If the apex sounds are ticktack in quality, *i. e.*, if the first sound is shortened and sharpened, or if there is a gallop rhythm at the apex, especially if the rate is rapid or easily made rapid by exertion, the probability that this is of serious import is great. If there is a history of breathlessness on exertion, of precordial pain, or of anginal attacks, the import is greater. Usually with such sounds the heart is definitely enlarged, but I have seen patients with this type of sounds, with angina-like pain, whose heart was not enlarged to percussion, and yet the myocardium was seriously involved as shown by pulsus alternans or definite disturbances in the ventricular complexes as shown by electrocardiograms indicating lesions in the conduction system, probably from interstitial myocarditis.

Like cardiac murmurs, some arrhythmias are serious, some are of slight importance. Sinus arrhythmia, a periodic change in the rate, the change often synchronous with respiration, is of no significance. Occasionally this type of arrhythmia gives a very prominent irregularity to the pulse. Various types of extra systoles or ectopic beats in themselves are of no significance. If there is no other evidence of cardiac disturbance, extra systoles are to be regarded as not constituting an indication of cardiac disability. The occasional to fairly frequent extra systoles, easily recognized as a dropped beat or an irregularly recurring long pause in an otherwise regular rhythm, seems to do no harm at all. When extra systoles become very numerous they indicate cardiac disability, but under these circumstances there are other indications of cardiac disturbance.

In the patient with extra systoles and a history of palpitation it is particularly hard to form a judgment of the actual cardiac condition, for much of the palpitation symptom-complex is of nervous origin. Probably a safe rule to follow is to judge in these patients of their cardiac efficiency by the amount of breathlessness brought on by exertion or from their vital capacity as measured by Dr. Peabody's method.

Paroxysmal tachycardia, though the heart appears normal between attacks, seems to contraindicate acceptance for military and similar duties because the patient is incapacitated during the attack, and the occurrence and duration of the attack cannot be foretold or prevented. Pulsus alternans is a definite contraindication to physical strain as it indicates severe myocardial disturbance.

Of all the irregularities auricular fibrillation and the closely allied auricular flutter are the most serious. Fibrillation can be recognized easily by the total lack of rhythm in the pulse, the absolutely irregular pulse, and the very common deficit between apex beat and pulse rate, so-called pulse deficit. This latter is observed in almost every case when heart rate is 100 or faster.

Dr. Levine recently has collected the data on the cases of auricular fibrillation observed at the Peter Bent Brigham Hospital (Levine: Auricular Fibrillation; Some Clinical Considerations. *Amer. Jour. Med. Sc.*, 1917, clix, 43). From this study some very important clinical facts have come. In the first place, it is a common condition, being the cause of cardiac breakdown in a large proportion of chronic cardiac cases. In thirty months we had 128 cases in our wards, and as they are often readmitted it is not uncommon to have 1/10 to 1/8 of our ward patients showing this condition. In 110 of the patients fibrillation persisted, in 18, or 14.1%, it was transient. The patients in whom the condition persisted divide themselves pretty sharply into two groups: a younger group, with definite history of rheumatism and signs of a chronic organic lesion of the mitral valve; an older group, with no history of rheumatism and no signs of organic mitral lesion. About 1/3 of the patients could not be placed in these two groups because there was evidence lacking as to one or the other of the criteria, rheumatic history or mitral lesion. In the younger group females predominate, 24 out of 39, and in the older group males are in excess, 23 out of 35. In only two of our patients over 50 with fibrillation was there a history of rheumatism and signs of mitral disease. The average age of the older group was 20 years older than that of the younger. Syphilis seemed to play a minor part in the etiology of patients with auricular fibrillation.

In the older group all patients had systolic murmurs in the apex region but only extremely rarely were there other signs of valve disease. Such murmurs were regarded as due to dilatation of the mitral ring, and our autopsy experience confirms this view. In 261 consecutive autopsies there were 154 on people under 50 years of age and among these 21 hearts showed chronic organic mitral valve lesions, while in 107, on people over 50, only 2 hearts showed organic mitral lesions, emphasizing the infrequency of chronic mitral disease in older people.

Besides the patients included in the number just discussed, we have observed numerous others in the Out-Patient Department who had auricular fibrillation. The striking thing about them is that they show definite signs of cardiac insufficiency or, if not present when the patient is first seen, these signs soon appear. Contrary to this we have seen some patients with transient fibrillation during acute infectious diseases who subsequently seemed to have undamaged hearts. We have observed two patients not included above who complained of frequent attacks of palpitation, who were observed to have transient auricular fibrillation, while between attacks their hearts seemed normal. Both were well developed athletic young men. This occasional type of case should be regarded in the same light as cases of paroxysmal tachycardia. All other patients with fibrillation, except these and those with transient fibrillation during acute infectious disease, should be considered as definitely incapable of undertaking muscular strain without the greatest probability of cardiac breakdown as the result. Fortunately, in young people, except those with mitral stenosis, auricular fibrillation is infrequent.

In individuals, with or without systolic murmurs, increased heart rate is of significance. If the heart is rapid or, after exercise, the increased heart action persists, the probability of cardiac inefficiency is very large. Patients who show the signs enumerated above as indicating cardiac insufficiency practically always have a rapid rate or one persisting after exercise. Even in the absence of these signs, a rate over 85 at rest should arouse suspicion as to the cardiac capability of a prospective soldier. The same is true if the heart does not slow promptly after moderate exercise. In some of these patients, though these rate disturbances do not point to cardiac lesions, they indicate hyperthyroidism, incipient tuberculosis and other conditions just as important as the basis for exclusion from military service.

All of what I have said above in regard to symptoms and signs which should be used to exclude from military service, apply as criteria of estimating probable cardiac functioning power in our patients. In concluding I would emphasize the points I have brought out in regard to systolic murmurs. I am inclined to think that it would be a great gain if systolic murmurs at the apex or in the left basal region were regarded as of no significance in themselves and their presence completely ignored except as a suggestion to look closely for some other sign of cardiac insufficiency.

THE BASIS OF CERTAIN CHANGES IN THE ELECTROCARDIOGRAM.

By Alfred E. Cohn, M.D., New York.

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For the purposes of clinical medicine it may be stated as a fact now generally accepted that the electrocardiogram is a valid record. It is valid because it remains unchanged except for distinct cause from a time shortly after birth until death. Constancy of form of the degree implied here refers to the larger phases of the curves, that is to say, to their general outline. Although the general outline may remain unchanged, small quantitative alterations may, nevertheless, appear. These are important in estimating the action of agents employed in physiological experiments, for small changes in the height and width of waves take place spontaneously. Reliance cannot be placed upon deviations of small size from a control curve, unless it has been ascertained that these do not otherwise occur. We have been interested in the effect of certain physical and chemical agents on the electrocardiogram. Among those tried was the inhalation of oxygen for prolonged periods of time. A series of curves, carefully standardized, was made at about five-minute intervals throughout a period of observation lasting one to two hours. These showed alterations amounting to several tenths millivolts, and were at first presumed to represent the influence of oxygen. So far as I know, curves taken so frequently have not before now been obtained for a purpose such as this, so that it is not known whether alterations of the magnitude mentioned occur naturally. To test the point, a second series was made, without giving oxygen, of the same individual for a comparable length of time under otherwise comparable conditions. In this series we obtained variations precisely as great as in the oxygen series. When the electrocardiogram is spoken of, therefore, as a valid record, capable of exact reproduction over long periods of time and unaltered except for cause, changes of the sort now indicated are understood to take place.

What the electrocardiogram represents has been in general agreed upon. Its waves, of which there are three principal ones, arbitrarily named P, R, and T, recur regularly in each heart cycle. Our principal concern with them until now has consisted in identifying each with an appropriate cardiac activity, so that the P wave is known to be associated with auricular, and the R and T waves to be associated with ventricular activity. Certain activities of the heart have been intensively studied in the light of these electrical curves, and considerable knowledge of the usual size and time or sequence relation of their waves under normal conditions has been accumulated. It is also known what alterations in cardiac mechanism are associated with specified changes in the size and sequence of the waves. By means of this technic, much of what still remained of the subject of the mechanism of irregularities of the heart has been uncovered. Certain groping beginnings have also been made in the direction of understanding what changes have taken place in the form and size and position of the heart, when certain unusual forms of the waves of the electrocardiogram are observed. When waves of a certain type are obtained, such, for instance, in which R_1* is tall and S_3 deep, that is to say, in a curve regarded as showing left ventricular preponderance, we begin to understand what sort of heart has given rise to them. The inference is drawn (1) from a comparison of the electrocardiogram with the roentgenogram, and (2) by analyzing the data so obtained, in the light of post-mortem studies of the weight of the component parts of the heart. Both studies have yielded a degree of knowledge of the meaning of the electrocardiographic waves, but both have revealed difficulties. On the one hand, although roentgenograms of a given type are found in association with electrocardiograms of a given type (the left ventricular type, for instance), similar ones are also found when the electrocardiogram is of a different (the right ventricular) variety. On the other hand, the weights of the various ventricular portions in some cases have not the relation the electrocardiogram led us to expect they would have.

These studies are, of course, based on the hypothesis that the form of the electrocardiogram depends on the distribution of the muscle by weight in the various portions of the heart, and on the relation of these portions to each other. It is not the purpose of this inquiry to discuss the validity of this hypothesis. I want, instead, to discuss certain experiments which approach the subject of the form of the electrocardiogram from a different point of view, leaving the question open of the relation of the form of the curve to the distribution of muscle by weight.

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* The small numeral at the foot to the right of the letter indicates the lead (according to Einthoven) employed.

Experiments have been performed by Mines, Boruttau and Samojloff, which show that the electrocardiogram may be regarded as the sum of curves derived in the following manner (Fig. 1). The heart is exposed. A point, A, selected about the center of one ventricle, is then burned so that no electrical potential is formed by the tissue treated in this way. If an electrode is then placed on the base of the ventricle B, and a second one on the neutralized area A, a curve AB is obtained which is monophasic, that is to say, has a single upward deflection, followed by a plateau and ending in a return to the base line. If the electrodes are next placed, one on the same neutral point A, and the second in the region of the apex C, a second monophasic curve AC is obtained, also having a deflection, but this time downward from the base line. The sum of these two curves yields a ventricular electrocardiogram EKG similar to those with which we are familiar. For example, assume (Fig. 1 A) that the first monophasic wave AB described has a value such that the height of the deflection is 9.0 cm., that the deflection maintains this height for 0.4 seconds, and then descends to the base line. And assume that the second monophasic wave AC described has a value such that the depth of its deflection is also 9.0 cm., but that the deflection begins 0.06 seconds after the first, and is maintained for 0.28 seconds only and then returns to the base line. If these two monophasic waves AB and AC are added, it is apparent that an upward deflection will be formed having a height of 9.0 cm. After 0.06 seconds, this deflection will be neutralized by the development of electrical potential in the opposite direction and the curve will return to the base line. But in view of the short duration of the second monophasic wave, its neutralizing power will disappear at the end of 0.28 second, that is to say, 0.34 second after the commencement of the first monophasic one. In view of the fact that this one, the first one, is still active and unopposed, a deflection upward will again appear, in height equal to the first deflection, and will be maintained until the expiration of the potential developed in the first curve. It is immediately apparent that the curve which results in this way from the two added monophasic curves resembles the electrocardiogram. It does not quite resemble the customary curve because of the height of the second or T wave. But the resemblance is made more striking by the introduction of a single complication in the second monophasic curve (Fig. 1 B) in the following way:

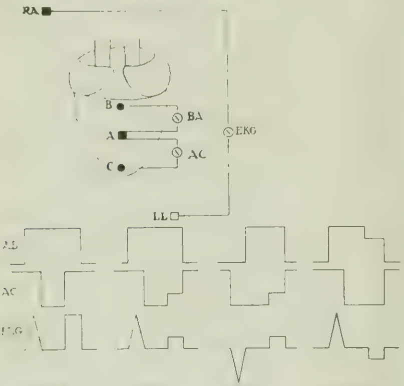
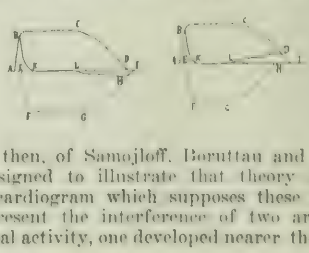


Fig 1A Fig 1B Fig 1C Fig 1D

The first, or upper, curve is unchanged; the second curve is also unchanged in the first portion. The deflection is maintained for 0.28 second as in the first curve, but then, instead of returning to the base line, it does so only to the extent of 1/3 the distance. Under the circumstances the first, or upper, curve is not unopposed and cannot make its entire influence felt. The second, or lower, curve still having a value of 6, permits it an exercise of potential having the value of 3 only. It is apparent, therefore, that when the small modification introduced in the second figure is considered, the curve resembles more closely the familiar electrocardiogram. There are two chief modifications of the electrocardiogram which are common, the first (Fig. 1 C) a curve in which the R wave is a downward deflection and the second an inverted T wave (Fig. 1 D). The two accompanying diagrams will make clear how the monophasic waves must be arranged in order that such curves may occur.



The diagrams, of course, represent only the principles on which this theory of the formation of the complicated electrocardiogram is based. How the monophasic waves actually appear when a normal curve is analyzed is obtained from the accompanying reproduction of curves taken from Samojloff (Fig. 2). These experiments, then, of Samojloff, Boruttau and Mines are designed to illustrate that theory of the electrocardiogram which supposes these curves to represent the interference of two areas of electrical activity, one developed nearer the base, the other nearer the apex of the heart, the two probably overlapping somewhat in the intact animal.

Eiger, Lewis, Selenin, and others base their theory of the spiked wave of the electrocardiogram on a system similar to that just described. It differs from it, however, because instead of supposing the curve to result from electrical activity on two sides of a line drawn transversely across the heart, they conceive it to occur on two sides of a line drawn parallel to the long axis and in a sagittal plane, that is to say, the curve results from an interference of the action of the two ventricles.

The important practical bearing of these theoretical considerations is found when the attempt is made to explain alterations in the electrocardiogram, obtained either by experimental or clinical means. They have been observed so far only in the terminal portions of the curve, that is to say, in the T wave or in the interval between R and T. In this portion of the curve a number of agents have been successfully employed in bringing changes about. The agents employed in experiments include the application of heat or cold to one or other portion of the surface of the ventricles, the stimulation of the vagus nerves, or the application of drugs such as muscarin. In clinical medicine it is now known to be caused by the administration of digitalis, and also under conditions which alter the volume of the blood, as has recently been shown by Morison. Of more than passing interest is the relation of the action of digitalis to the form of the terminal part of the curve; indeed, its action may be exerted so that the form of the curve is changed throughout the period from the termination of R to the end of the T wave. The T wave, under its influence, is altered in sign from positive to negative, or from negative to positive.* The alteration occurs in most instances as the first detectable sign of the action of the drug—before changes in auriculo-ventricular conduction occur, and before any sign of the subjective symptoms of intoxication is developed. The sign has, indeed, been found of value in administering the drug, especially in ascertaining the effectiveness of a given preparation and of its sufficient dosage. It is not yet known—though the knowledge is worth possessing—whether the time at which the T wave change occurs represents the point beyond which it is not important to push the drug to obtain a beneficial effect. If it were true that the altered T wave represents such a point, a definite advantage in digitalis therapy would be gained. The belief is now expressed that the point of change in the T wave is the point beyond which pushing the drug represents no advantage.

Theories which consider the factors underlying the formation of the terminal portion of the ventricular curve are few. That the T wave depends on the relation of two monophasic waves such as we have just considered, is, no doubt, plausible. But what the factors are that determine these electrical values is still doubtful. It has been maintained by Lewis and by Cotton, following the initial suggestion of Einthoven, that the relative weight of the muscle of the different portions of the ventricles is the essential determining factor. And while, on the whole, this may be true, we have already seen that the form of the T wave may change frequently and quickly in the same individual under the influence of digitalis and of alterations presumably in blood volume. Under these circumstances an alteration in muscle weight or of muscle volume is out of the question. Emphasis may be placed, in passing, on the fact that under these circumstances the first spiked (R) wave does not change. But other properties of muscle, so far not suggested in this connection, may result in changes in the electrocardiogram. These should be subjected to investigation.

At first it is striking that the portion of the electrocardiogram, which alters under the influences that have been mentioned, is the later part of the ventricular electrocardiographic complex. Apart from other considerations, this should not be surprising because the terminal part of the electrocardiogram refers actually to the greater part of the curve. The initial part of the electrocardiogram is a small portion of the total period of the cycle, because its formation depends, as has been shown, on the initiation of electrical potential in the various parts of the ventricles. This occurs rapidly, but at different instances of time. Why a difference in time occurs, we must attempt to make clear. We are taught as the result of the most recent experiments that the impulse which sets the ventricles into activity reaches all portions of its substance at substantially, but not exactly, the same time. Experiments in dogs, indeed, have shown that there are differences of a little less than three one-hundredths second. Although they are small, these are none the less sufficient to permit an explanation of the spiked wave, on the basis of the pair of monophasic waves that have been described. It is impossible, as yet, to show exactly in what manner in a given heart the time of arrival of the impulse at different sites determines the nature of the interfering electrical responses which serve as the basis of the form of the first or spiked wave, nor to assert that time is the only factor concerned. But it is not difficult to understand certain conditions which can be responsible for alterations in the form of the spike. Normally the form of the spiked wave is probably maintained, first, by the fact that the pathways an impulse must travel, and consequently the length of time required, to reach the various portions of the ventricular muscle, maintain similar relative lengths; and second, that the difficulty or facility of impulse travel over these pathways is equal in the two ventricles. It becomes clear that should there arise either an alteration in relative length, as, for instance, in dilatation of the left ventricle, or increased difficulty in impulse passage, in one or more portions, as in toxic heart block or in bundle branch lesions, that the usual balance will be disturbed. What may be expected to follow as the result of such disturbances is an alteration in the relative value in time of the two monophasic waves we have been considering. Should the impulse pathway be altered so that the impulse reaches the second earlier than the first, the inverted spike is the form we should expect.

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* Nicolai and Simons reported first an instance of the latter sort. By an oversight, this reference was omitted from our earlier reports.

If the formation and form of the first ventricular waves depend on forces such as have been described, it follows that the actual weight of the muscle which constitutes the walls of the ventricles and enters the septum need not have altered to produce change. But we are not yet in a position finally to adopt this view.

Finally, it may be urged that the fundamental changes in the electrocardiogram have been explained as due to alterations in relative weights on the basis of a crude technic. The theory has been that the muscle which confines each ventricular cavity is an entity. We know, however, from the work of MacCallum and of Mall, that this arrangement does not represent the facts, although for rough purposes it serves in most instances. Therefore an elaboration of the weight theory, rather than the introduction of a new hypothesis, may be required, weight being taken in terms of the layers shown by MacCallum and Mall to exist, rather than weight in terms of the cavities' walls. I have attempted to correlate electrocardiograms with the weights of the layers in such dissections, but on account of the difficulty of the technic have not been able to come to a conclusion of the study.

It appears, then, that the electrocardiogram, usually so constant a physical phenomenon, depends on factors scarcely understood. The form of the curve is explained as depending on the algebraic sum of electrical potentials arising on muscular activity in different portions of the ventricles. These may depend primarily on activity above and below a horizontal line through the heart or to right and left of a vertical one. Both views have been suggested, and these are probably capable of being harmonized. But it is at this point that our difficulties begin. On both sides of either of these lines, what are the factors that determine the value of the potential generated? They may, as we have noticed, be altered by a variety of agents,—by nerve stimulation, by the application of heat and cold and chemicals in experiment, by drugs and means apparently physical in human beings. Are these factors which determine changes, the weight of the muscle, its tension, or its ultimate chemical relations? So far the only investigation attempted relates to muscle weight. Studies in other directions have been suggested, but so far the problem is still open to further study.

ACUTE CARDITIS.

BY FRANK TAYLOR FULTON, M.D., PROVIDENCE, R. I.

IN the consideration of the subject of acute carditis it is my purpose to limit the discussion chiefly to the condition as met with in the course of acute rheumatic fever. Commonly, in referring to an acute infection involving the heart, if there is a friction rub one speaks of acute pericarditis. If, perchance, a murmur and other signs develop, one characterizes the condition as acute endocarditis; but the intimate relation between the pericardium, myocardium, and endocardium is such that there is not likely to be a very active infection of any one of them without, to a certain extent, having involvement of one or both of the others. A consideration of the anatomy and of some of the well-known acute cardiac pathology will further convince us that the heart musculature should receive more attention in acute infection than we have been in the habit of giving it.

As you may know, Aschoff and Tawara,[1] stimulated by the desire to discover the reason for the comparative feebleness of hypertrophied heart muscle, examined a large number of hearts very carefully, the result in the majority of cases being negative. In a certain number of cases of chronic valvular disease supposedly of rheumatic origin, they did discover certain inflammatory changes characterized by the presence of what has been called submiliary myocardial nodules. Coombs[2] has since, in corroboration, given a particularly thorough and detailed account of these nodules and their distribution. They are inflammatory in nature—rather smaller than a miliary tubercle, with a groundwork of fibrin in which are various types of cells, some of them leukocytes, some of them plasma cells, some of them endothelial cells, but most important and characteristic of all, very large multi-nucleated cells, these latter of varying size and shape. There is no absolute regularity of distribution, but they are found more commonly in the perivascular tissue, especially in the walls of the left ventricle, but there is some evidence that the region about the central fibrous body is very liable to be invaded. The muscular part of the interventricular septum and the papillary muscles are only rarely involved, and the auricular muscle almost never. They are in the subpericardial tissues, and are quite likely to be present in the fibrous tissues of the valves, most often mitral, but sometimes the aortic and tricuspid. They are more abundant in valves that have been vascularized and deformed from former inflammatory attacks. The evidence seems to be that they always arise in the connective tissue, that they are of short duration, that they may come in successive groups, and that they may vanish into scar tissue.

The question has continually arisen as to whether these so-called Aschoff bodies are characteristic of rheumatism or whether they are present in association with other infections. Without entering into the discussion, I may say that the weight of opinion and of evidence is that they do develop only as a result of the infection which we have long known as acute rheumatic fever. They have been found in association with chorea, a point which is brought forward to prove the intimate relationship believed to exist between chorea and rheumatism.

Another result of the work of Aschoff and Tawara was the demonstration in detail of the conducting system of the heart. As you know, the muscle bundle of His has long been recognized as the path for the conduction of the impulse between the auricle and ventricle. Tawara found that the main trunk of this bundle passed along below the membranous portion of the interventricular septum, and that just above the muscular portion of this septum it divided into two branches, one going to the left ventricle and the other to the right. He further found that these main branches subdivide into small branches, and ultimately into minute ramifications which are distributed throughout the inner surfaces of the right and left ventricle, being continuous with the so-called Purkinje net-work. I mention this conducting system in some detail because it is of fundamental importance in understanding some of the damage which may be done by a myocardial infection. You can easily see by referring to the specimen which I now show you how readily an acute infection involving the muscle of the heart might encroach upon the system at some point or points and interfere materially with its action. In fact, Aschoff[3] makes the following statement:

> "Now we do find not infrequently, especially in cases of rheumatic myocarditis, actual destruction of the smaller and larger branches of the conducting system, the already described specific rheumatic nodular structures having a special tendency to develop beneath the endocardium and occasionally right in the connective tissue sheaths of the system. Such inflammatory multiplication of cells finally destroy the muscle fibers of the conducting system."

When this inflammatory process is particularly active in the region of the main stem of this bundle, the function of the bundle may be seriously interfered with or, for a time, entirely suspended. Normally there is an appreciable time consumed in the passage of the impulse through the main stem of the bundle. The maximum normal time in the passage is about one-fifth of a second. This is indicated in the difference of time in the contraction of the auricle and the ventricle, and can be very readily measured, either by the polygraph or by the electrocardiograph. Whenever there is an increase in the time interval between the contraction of these two cavities, we know that there is an impairment of the conductivity of the bundle.

Formerly, heart-block was considered chiefly in connection with chronic heart disease. It is now recognized as one of the important complications of an acute inflammatory condition of the heart. It may occur with many of the acute diseases, and in acute rheumatic fever it is not at all uncommon. Its recognition is of prime importance; for, if we detect its presence, we have then direct evidence that the myocardium is involved. It may occur at any time during the course of acute rheumatic fever, and may be the only evidence which can be obtained that the heart is actually attacked, for the toxic effect of the infection may temporarily give rise to much the same cardiac symptoms as though the myocardium were actually invaded. Moreover, it may be the first sign to suggest that the infection is of the rheumatic type. White[4] has only recently reported a case of a boy of 18 who came to the out-patient department, apparently suffering from an acute cold of four days' duration, associated with cough and coryza. At that time he had an irregular heart due to acute heart-block, caused by acute myocardial infection. He subsequently ran a typical course of acute polyarticular rheumatism. The writer has recently observed a case in a young physician, an intern in a hospital, who did his hospital work up to the time of the onset of heart-block. The first symptom which he noted that seemed of any consequence was an irregular heart action, associated with a sense of pressure over the precordium. This was found to be due to partial heart-block. The irregularity persisted for one day only. Electrocardiographic records were taken daily and the conduction time, which was at first double that of normal, returned to normal within a week. Rapid heart action with some cardiac enlargement persisted for a good many weeks. There was at no time any fever. Another case observed by the writer was that of a young man of thirty, who three weeks after an acute tonsillitis was admitted to the hospital almost *in extremis*, with acute cardiac dilatation. His heart action was very rapid, but regular. About two weeks afterwards, he developed an irregular pulse which was demonstrated to be heart-block. The irregularity persisted for about two days only. The conduction time was increased for some time. The exact date of its return to normal was not observed, but it was normal three weeks later. The temperature in this case was 104 on admission. It dropped to normal on the following day and was not above normal again, although the heart-block did not develop until two weeks later. In these two cases the diagnosis of rheumatism is not entirely clear. Considering all the evidence, it is fair to conclude that they were caused by the same infecting agent which is the cause of acute rheumatic fever.

So much for the consideration of the effect of an acute infection upon the conducting mechanism of the heart. There is, however, still remaining a large amount of the myocardium which may be involved without this infection being manifested by any disturbance of the heart rhythm.

Coombs[5] has written rather extensively on the subject of rheumatism, and divides the cases of rheumatic infection in which there are serious heart complications into four groups. In the first and more important group are those cases in which there is general enlargement of the cardiac area with signs of mitral insufficiency; second, those in which the same signs are present, associated with pericarditis; third, those in which there is associated some evidences of valve deformity, either aortic incompetency or a stenosis of the mitral valve; and, fourth, a group rarely represented, characterized by a malignant endocarditis. His studies had largely to do with children, and of these, about three-quarters of the patients belonged in the first group; that is, those in which there is a marked increase in the area of cardiac dulness, and a well-defined systolic murmur. The evidence, according to him, is that the insufficiency which is present under these circumstances is relative, and is due to the dilatation of the left ventricle; and it is fair to assume that this dilatation is due to the inflammatory reaction in the muscle. It is scarcely conceivable that the small vegetations which are frequently observed at autopsy on mitral valves in such cases can have much, if any, influence upon the formation of such a murmur. In two of Coombs' cases which came to autopsy there was considerable enlargement and dilatation. There was a systolic bruit and a sharp diastolic shock felt over the pulmonic area with the accentuation of the pulmonic second and reduplication of the second sound at the apex. In these, there was not the slightest evidence of endocarditis or pericarditis. Briefly stated, his belief—in which the writer concurs—is that a large percentage of cases have myocarditis without either pericarditis or endocarditis that is *demonstrable*. He believes that the cause of death in rheumatic disease, before the age of sixteen, is more often due to acute inflammation of the myocardium than to anything else, and even above this age, it often plays a very important part.

A word with reference to the late sequelae of an acute cardiac infection. It is a difficult matter to estimate the amount of permanent damage which has been done either to the valves, the heart muscle proper, or to the conducting system. Lewis is of the opinion that an ordinary attack is usually only one of a number of steps which lead to the crippling of the heart, and that it is by oft-repeated damage that the incurable rheumatic hearts are produced. However, there is a good deal of presumptive evidence that, after the valve is once damaged, there is a progressive change which leads gradually in later years to those serious valve deformities and insufficiencies which are so commonly met, although there is no question but that hearts with repeated infections are far more likely to fail rapidly. It is certainly true that a valve can never be returned to normal after having become deformed. It is reasonable that the same opinion should be held with regard to the involvement of the conducting system. This involvement may be in the main stem, in either of the two main branches, or in the smaller branches. It may be transient, lasting but a few days, or it may be permanent; it may be a complete destruction of the bundle, or a slight local inflammatory swelling or edema; it may be recognized with fair certainty, on physical examination, by noting the dropped beats if they occur, and with absolute certainty by polygraphic or electrocardiographic tracings. Generally it is rather transient, but its duration may vary a great deal. If produced by some edematous swelling, it is conceivable that it would last only for a day or two; but if produced by inflammatory infiltration, the condition of the block may last for several weeks; or, at any rate, the facility with which the impulse is conducted may be impaired for a considerable period, and possibly permanently.

In acute rheumatism where there is slight impairment of conduction, if digitalis is given, the degree of impairment is likely to be increased and a serious heart-block may occur. On that account one should always be cautious about the use of digitalis in acute rheumatism.

Most cases of auricular fibrillation fall into one of two main groups: one group includes those occurring in elderly people and such cases are of the cardio-sclerotic type; the other group includes those cases which occur in younger people, usually associated with mitral disease, and usually with a history of rheumatism or chorea.

It is well known that the most striking effect of digitalis in slowing the heart rate has been in cases of auricular fibrillation. It is also well known that digitalis reduces the heart rate in these cases by its action upon the conducting system, reducing its conductivity so that fewer impulses are transmitted to the ventricle. It is further known that the bundle once damaged is distinctly more susceptible to the action of digitalis than is the normal bundle, and it is not at all unlikely that in many cases of rheumatic infection, the conductivity of the bundle is permanently impaired. It has been found to be a general rule, however, that the sclerotic cases are not well controlled by digitalis, but that the cases associated with mitral disease with a history of rheumatism or chorea are particularly susceptible to digitalis. It is quite likely that the efficiency of the drug is to some extent due to the previously existing impairment of the conductivity of the bundle.

It is now generally recognized that in acute rheumatic fever there is usually some primary focus of infection aside from that of the joints or the heart. This may be in the tonsils, in the teeth, or in some other locality. If that focus persists, it is, of course, important to discover it and, if possible, remove it. Whether it is advisable to do this during an acute febrile attack may be questionable, unless there is a prolonged persistence of the symptoms. Absolute rest in bed is imperative. How long the patient should be kept at absolute rest is often very difficult to decide. It is much better to make the mistake of having too much restraint than of giving too much freedom. I think it is quite certain that the majority of cases are allowed to get up too soon. The patient should be confined to bed until there is every evidence that the heart has returned as nearly as possible to its normal condition. During this time the patient should have plenty of fresh air and should be given a well-regulated diet of sufficient caloric value. In no other condition is judgment and tact more needed than in handling these cases. A patient suffering from acute myocardial infection, well treated, may recover so as to live an active, useful life. If badly treated, however, his whole future may be greatly modified by a seriously crippled heart.

REFERENCES.

[1] British Medical Journal, Oct. 27, 1906.
[2] Journal of Pathology and Bacteriology, April, 1911.
[3] *Ibid.*
[4] Amer. Jour. of Medical Sciences, Oct. 1, 1916.
[5] Quarterly Journal of Medicine, October, 1908.

DISCUSSION.

Dr. Samuel A. Levine, New York: My remarks will be necessarily scattered, touching on a point or two brought out in the papers here.

The first thing that occurs to one is, what has electrocardiography taught the medical profession? I think it may be summarized in the statement that it has given us a clearer conception of the heart mechanism. It has taught us a great deal about the irregularities of the heart. We understand them; how often they occur, their clinical significance, and in many instances we know what the future course of events is apt to be, as a result of a certain arrhythmia. That part of the work is almost complete. But the work that Dr. Cohn has mentioned and Dr. Williams has spoken about is a line that may be very fruitful, namely, changes in the form of the curve. The changes in the form of the curve may give us indications as to what is going on in the heart muscle that we cannot get any other way, because, as is needless to say, the electrocardiogram is a delicate representative of the heart mechanism, of something that is going on in the heart, and may be changed by disease. As we will understand the forces that control the form of the curve more thoroughly, we will understand the aberrations of the heart mechanism, and this will help in an early diagnosis of chronic myocarditis.

The recent work done by Oppenheimer and Rothschild of New York is very suggestive, as they have shown that certain changes in the electrocardiogram are frequently present in chronic myocarditis, *i. e.*, the senile heart. So it seems that changes in the form of the curve may be of increasing significance as time goes on.

Dr. Christian spoke about the importance of the history and symptoms in appraising what a heart is doing, and I just wish to emphasize that point. A systolic murmur with a history of rheumatic fever means a great deal more than a systolic murmur without a history of rheumatic fever. A diastolic murmur, as he said, in civil life is significant. Generally it means organic heart disease. Some French military men have recently found soldiers who have had normal hearts, develop diastolic murmurs in the pulmonary area from the strain of war life, who have not had heart disease, and they attribute it to temporary dilatation of the pulmonary ring. That may be of some importance to those of us who meet soldiers with diastolic murmurs in the pulmonary area and with no other symptoms of heart disease.

Dr. White of the Massachusetts General Hospital has found pulsus alternans with surprising frequency in various heart cases, and we all know that pulsus alternans when present is of very grave prognostic significance. The duration of life, on the average, is from six months to a year. Not infrequently one can detect pulsus alternans while taking the blood pressure. I thought it would be worth while to mention this because we do not all know about taking tracings and we do not all have the means of taking them. While recording the blood pressure as the mercury falls from 180, at 160 only every second beat might come through, that is, the stronger beat of the alternating pulse, and as the mercury falls to 150, the other or weaker beat comes through as well. The difference of 10 millimeters between the strong and the weak beat may become evident in taking the blood pressure and one will be thrown on one's guard as to the presence of alternation in this way. That is particularly true in the cases of angina pectoris, where the main symptom may be pain. I remember a case of that type in a man where the pulsus alternans became evident very readily while taking the blood pressure.

The importance of the increase of the conduction time, that is, so-called P-R interval in electrocardiography, comes out in a series of cases which one might call acute polyserositis. There are quite a few cases of acute rheumatic fever which run a course as follows: First, the synovial membranes of the joints are affected, then the synovial membrane around the heart, and very frequently the pleura as well. One has therefore an acute arthritis, acute pericarditis and acute pleuritis. In fact, if one remembers this symptom-complex, one can frequently tell what has happened and what will happen in some of these cases. You may hear a friction rub over the pericardium; then if you listen below the left scapula, you will find bronchial breathing. Sometimes a few hundred cc. of fluid may be removed from the left pleural cavity. These cases always show a lengthening in the time it takes for the impulse to come from the auricles to the ventricles. Lengthening of the P-R interval is an absolute indication of a toxic process going on in the heart muscle, and that lengthening may persist for two weeks or three weeks after the symptoms of rheumatic fever have disappeared. If one appreciates the significance of this, he can see that such a patient has an acute process of the myocardium and, as Dr. Fulton has emphasized, needs a more careful and more prolonged rest treatment than others might need. This condition may perhaps be the early cause of conditions that we see, such as adherent pericardium and chronic myocarditis.

Even in the presence of a systolic murmur the diagnosis of mitral endocarditis during acute rheumatic fever is extremely difficult. There has not been sufficient time for mitral stenosis to develop, of course. The systolic murmur may be due to valvular relaxation or it may be due to a real endocarditis. We have no means of telling which it is. We do have a definite means (in the electrocardiograph) of telling whether the myocardium is affected, as has been mentioned above, and this means should be employed wherever possible.

In closing I believe it is well to think of the question of heart disease as divided into two problems, one the problem of acute rheumatic fever and chorea, and the other, the problem of cardiac sclerosis. Practically all hearts, excepting the syphilitic, fall into these two groups. The treatment that we give in all heart cases is merely palliative. We help patients, and good treatment is much more effective than poor treatment, but treatment of the young heart should begin with prevention and proper treatment of rheumatic fever and chorea, and the treatment of the senile heart brings us face to face with the prevention and treatment of all the senile changes that are going on in the kidneys, the heart and the arteries.

Dr. Horatio B. Williams, New York: I should like to say in regard to Dr. Christian's paper one or two things. I have found that in deciding what to do with people who have murmurs it has been a help to me to think in this way: First, the murmur is of significance only so far as the thing which causes it is producing a disturbance of the circulation. If we see the patient for the first time and he has a murmur, that murmur may be one indication of an active endocarditis and it devolves upon us to find out, if possible, whether that is true before we say anything about the murmur. A very slight murmur of any kind whatever, if it is a sign of active endocarditis, means something serious, possibly, and at any rate means we must exercise caution. If the case is not active endocarditis and we know that the murmur has been present for some time, say for several months, we can judge of the significance of the murmur by the extent of muscular hypertrophy which has been produced, and in advising people what to do I have found it pretty safe to advise them to disregard murmurs which have been present for several months or longer and have not produced an hypertrophy.

It has been shown in my laboratory that a little obstruction of the aorta or pulmonary artery will produce most marked hypertrophy of the corresponding ventricle inside two weeks, so we do not need to wait an unconscionably long time before we will get an hypertrophy with a disturbance of the circulation that is really of considerable magnitude.

In regard to the alternating pulse, I should like to say this: I recognize the seriousness of the true alternating pulse, but I do not believe it is admissible to make a diagnosis of a true pulsus alternans simply from palpation with the finger or from tracings of the radial pulse because I have had cases referred to me in which the tracings showed a strong beat alternating with a small beat, the small beat being placed exactly midway between two large beats. When that case was examined further it was found that the weak beat was merely an extrasystole. Being premature, and a weak beat, it takes longer to get the aortic valve open, and by the time it has been transmitted to the wrist the prematurity has been lost. One can usually distinguish such cases by listening at the apex with the stethoscope.

Fibrillation is a serious handicap to a heart otherwise damaged, but it occurs every once in a while in people in whom we cannot find any other sign of cardiac disease, and those people often do pretty well for a long time. I have in mind a man who was an amateur tennis player. He played an aggressive game of tennis, and one day after playing a very hard game of tennis he thought his heart was going harder than usual and he consulted a physician. It was found that he had auricular fibrillation, and his pulse rate, when quiet, was 130. He seemed to feel perfectly well and fit and was advised to take a little digitalis and go on with his work in the regular way and see what happened. He was a mining engineer and took a position in charge of a big mine where his responsibilities were heavy. On one occasion he went down into the mine and when it was time to go up, the apparatus for raising him out of the mine was out of order. He and another man climbed seven hundred rungs of a ladder vertically upward. The other man fainted on the way up, a man with a perfectly good heart, and he had to hold him on the ladder until the faintness was over and then helped him to get to the top. The engineer himself suffered no embarrassment. I saw him three years after I first examined him and he said he was feeling just as fit as ever. What will ultimately become of him I don't know, but it anything else happens to his heart or if he gets any infectious disease where the heart is put under an undue strain, he would not be as good a risk as a normal man.

In regard to extrasystoles, they can occur as often as once every other beat of the heart in a person otherwise healthy without the subject being conscious of their occurrence or experiencing any embarrassment from it. I have seen a young man who went through college and who is now in charge of a big iron works in China, and has been for several years, who had extrasystoles all the time, every other beat, and he seems to have remained perfectly well and fit. I recall another man who was a chauffeur who could get out and crank up a heavy car in winter when it wouldn't start, and any of you who have tried that know it takes an able-bodied man to do it. He had extrasystoles all the time when he was asleep, but when his attention was distracted in any way they stopped.

I have an impression, based on clinical experience, that young men whose extrasystoles come on only when they are quiet are a good risk, and elderly people whose extrasystoles come on as the result of exercise are a worse risk than they would be if they did not have the extrasystoles. I think one can demonstrate the difference between these two classes of cases quite readily.

Dr. Henry A. Christian, Boston: I am the only one who has participated in papers or discussions who is a native, so I would like at first to express my thanks and the thanks of the Section to Dr. Williams, Dr. Cohn and Dr. Levine for coming on from New York and to Dr. Fulton for coming up from Providence and adding so much to the value of our afternoon's program.

I am very glad that Dr. Williams brought out the points which he did in regard to what I had to say. What I had to say was pretty destructive to a good many of our gods. Dr. Williams destroyed a few more that I hardly dared attack as vigorously as he did.

What he said about the pulsus alternans should be emphasized, that is, the importance of a distinction between what you might call a true pulsus alternans, that is, alternation in the size of the pulse beat, not accompanied by an irregularity in the rhythm of the impulse, and a pseudo-pulsus alternans such as is often found in auricular fibrillation or with recurring extrasystoles. Very often in these you will get an apparent pulsus alternans with variations in the size of the beats, but it has not the same significance as the true pulsus alternans.

Then I think distinctly important is what Dr. Paul White has emphasized in one of his papers, the appearance of true pulsus alternans following ectopic beats; that is, the patient's pulse is quite regular for six, eight or ten beats and there is no alternation of the pulse, then there is an ectopic beat and following that ectopic beat the regular successive beats for three or four beats show a definite alternation. This symptom is an earlier process of what later on becomes a more maintained and more persistent pulsus alternans.

It regard to the elderly people, I did not have that in mind in relation to the extrasystoles because I was talking particularly about the younger people, —of people in whom the question would come up for military service and so on.

The two cases that I referred to of intermittent auricular fibrillation are apparently existent in people who are perfectly normal. They do not have any shortness of breath, no edema, no symptoms at all except palpitation, when they have this auricular fibrillation. One of these fellows is distinctly uncomfortable at the time, and when I have seen him in the attacks I would say at that particular time would be unfit to be sticking another fellow with a bayonet. I think he would get the worst of it if he had an attack at that time. It is more or less like an attack of paroxysmal tachycardia where between attacks the patient is capable of physical strain but during attacks is unfit.

I was very much interested in what Dr. Fulton had to say about acute carditis. I think it is very much more common than we ordinarily regard as being the case, a very considerable per cent. of the cases of rheumatic pericarditis showing disturbance in the conduction time or a definite heart block We were interested in that for a time at the Brigham Hospital and were making electrocardiographic tracings at pretty frequent intervals of patients with acute pericarditis, and distinctly more of those cases than less had a definite disturbance of conduction amounting to a partial heart block. The feature of interest in those cases to us was that it did not seem to make any difference in their immediate prognosis whether they had a heart block or not. They all got well, they all left the hospital with a heart apparently functioning quite normally, and a year or two after that they were all capable of doing a considerable amount of active work; so, notwithstanding the fact they had this definite evidence of lesion in the myocardium, they are not seriously handicapped so far as the immediate future is concerned. Of course very likely in the future,—possibly in eight or ten years or longer,—they might show advanced mitral stenosis and then they might go to pieces sooner with a defective myocardium, probably with auricular fibrillation.

Then finally in regard to the form of the electrocardiogram, which was discussed by Dr. Cohn and touched upon by Dr. Williams—we are very much under obligation to both of these gentlemen for the excellent studies they have been conducting on this phase of the subject. As Dr. Levine pointed out, it is one of apparently very great importance in the consideration of our cardiac cases. The disturbances of the ventricular complex and their relation to muscle disturbances involving the terminations, the minute terminal arborizations of the conduction system, as just hinted at in Dr. Fulton's diagram, are very important. The network of conduction fibres is extremely rich in the heart; there is an interlacing network of those fibrillae everywhere under the endocardium of the ventricles. so that lesions that affect the heart muscle have a very good opportunity to disturb in some way the electrical conductivity of the heart or the electrical impulses. and these disturbances are expressed in changes in the form of the ventricular complex, and we are learning to put much greater importance upon these changes.

It is these experimental studies that are particularly valuable for giving us a clinical basis for the interpretation of these variations in the ventricular complex, and, as Dr. Levine said, it is one of the very important fields now under study from which I think we can expect applications which are going to be very serviceable to those of us who clinically apply to the individual case such knowledge as we can get about his condition from various methods of study in the effort to improve his condition by therapeutic measures.

Dr. Frank T. Fulton, Providence: I am very glad that Dr. Christian said what he did about the frequency with which the myocardium is likely to be involved in the course of acute rheumatism. I did not emphasize that point, but I quite agree with what he said in reference to it Inasmuch as this is the only positive sign available that the myocardium has actually been invaded, it seems to me that it ought to be made a rule, whenever possible, to have careful electrocardiographic observations upon all rheumatic cases. As everyone knows, a case of rheumatism may be very mild, but subsequently show serious heart damage. It is sometimes a difficult matter on physical examination to detect any cardiac involvement, and such cases of rheumatism are very likely to be allowed to get up within a few days and go about their business. If one knew that there was a definite infection of the heart, as might be determined by an electrocardiogram, one would be much more careful about the immediate future of the patient.

Treatment of Pernicious Anemia—Especially by Transfusion and Splenectomy.

By George R. Minot, M.D. Boston, and Roger I. Lee, M.D., Cambridge, Mass.

[From the Medical Service of the Massachusetts General Hospital.]

Before taking up the actual treatment of pernicious anemia, it seems desirable from our study of ninety-six cases* in the past three years, and in view of the present state of the knowledge of this disease, to point out certain things on which treatment depends.

The first essential for the treatment of pernicious anemia is a correct diagnosis. The anemias due to chronic hemorrhage, parasites, sepsis, dysentery, malaria, syphilis, malignant disease, myxedema, etc., at times may be confused with primary pernicious anemia; also idiopathic aplastic anemia and various types of splenic anemia and hemolytic jaundice, more especially the acquired type, are to be differentiated from pernicious anemia. Certain cases of anemia resembling pernicious anemia, associated with pregnancy, with chronic polyarthritis and with grave liver disease, also belong to another class. Quite probably certain cases apparently not hemolytic jaundice with the blood picture of pernicious anemia, but with a hemolytic type of anemia and a very large spleen, had also better be grouped separately from pernicious anemia,[1] and in the future we may quite possibly more completely further separate cases now grouped as pernicious anemia.

Very few cases are diagnosed until the disease has existed for some months. Important points in the diagnosis are: a history of an insidious onset, of remissions, of sore mouth and tongue, and of spinal cord symptoms, and the presence of achlorhydria without evidence of malignancy. The blood picture is, of course, important, but the diagnosis is not to be made upon this alone. The presence of large deeply staining abnormal shaped red cells, together with microcytes, leucopenia, diminution of platelets, and a high color index, etc., are significant. Likewise, evidence of increased erythrocytic destruction is a valuable diagnostic point.

BLOOD DESTRUCTION AND BLOOD FORMATION.

Two features of the disease are the abnormally increased destruction of the erythrocytes and an abnormal type of blood formation. It is evident that at any given time the number of blood elements merely represents the balance of destruction and formation. In judging the prognosis of a given case and the effects and desirability of therapeutic procedures, one should estimate the relative rate and degree of destruction and regeneration of the formed elements of the blood, especially the erythrocytes. This balance of red cell destruction and formation Schneider[2] has referred to as the hemopoietic-hemolytic index.

RED CELL DESTRUCTION.

Red cell destruction can be studied by the excretion of urobilin in the stool[3] or duodenal contents.[4] We have also suggested that it may be studied by the tolerance to intravenous injections of hemoglobin.[5] It is probable that information about erythrocytic destruction can be derived in a simpler manner by the estimation of the bile pigments in the plasma, as determined by the dilution required for the plasma or serum to lose its "yellow" color. We have been and still are studying this, and it has been referred to by Blakenhorn.[6] The degree of icterus exhibited by the patient serves alone as a very satisfactory test, but is sometimes misleading. From the appearance of microcytes in fresh preparations stained with brilliant cresyl blue, one can perhaps derive some information concerning their destruction. The presence of fragmented red cells, as pointed out by Rous and Robertson,[7, 8] are important. The presence of numerous small reticulated red cells we have associated with active regeneration in the presence of increased destruction.

BLOOD FORMATION.

BONE MARROW STIMULATION AND BONE MARROW THRESHOLD.

In order to gauge the power of regeneration and formation of the formed elements of the blood, one must scrutinize the activity of the marrow, not only the intensity but the quality of its activity. Increased activity of the marrow may occur from some stimulus that increases the production of not only one, but particularly of all its three chief elements normally found in the circulation,—the polymorphonuclear neutrophiles, platelets, and red cells. Such increased activity as a method of compensation may be referred to as bone marrow stimulation. The evidence of this can perhaps best be formulated as follows: increases over previous counts in a given patient of the polymorphonuclear neutrophiles, platelets, perhaps particularly if these are of small size, and the reticulated red cells,* especially when that increase means an increase of total reticulation, showing many nodal points in the reticulum, and when all the reticulated cells are not large ones. Decreased activity is associated with an absence or diminution of the factors indicating activity.

Under certain conditions in pernicious anemia this method of marrow compensation is inadequate or cannot be effected. In some instances, as Naegeli[9] has suggested, nature appears to make an effort at compensation by lowering the level of a theoretical barrier that is normally present to prevent all the marrow elements from being poured forth. The result of such an altered threshold is that the more immature elements, that nature tenaciously conserves, enter the circulation. This method of compensation, if persistent or marked, is often to be looked upon as indicating a serious condition, and may often be seen as a terminal picture when the elements of the marrow are poured forth into the blood stream. This lowered threshold is rather especially evidenced in the erythrocytes as indicated by the presence of many blasts, particularly early forms, and nuclear remains, as Cabot ring bodies, chromatin particles and Howell-Jolly bodies. The presence of these latter structures in the peripheral blood is especially associated with altered splenic function, and especially after its removal. It seems that this organ has in some manner a regulatory action over the marrow. When Howell-Jolly bodies are present, they do not necessarily vary with the presence of even many blasts. With the presence of many blasts, there is inevitably associated an increase of the reticulated cells, but proportionate to the number of blasts and not as seen with stimulation out of all proportion to their number. Evidence of altered threshold is, perhaps, seen in the white cells by the presence in the peripheral blood of myelocytes, and also large mononuclear cells, often atypical, that give the oxydase reaction, and thus presumably of the myeloblastic series. These may or may not be associated with an increase of the polymorphonuclear neutrophiles. Abnormally large platelets may at times be associated with altered threshold.

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* The diagnosis of idiopathic pernicious anemia was unquestioned. All the cases had complete laboratory studies; nearly all had [illegible] examination of the gastro-intestinal tract.

* Reticulated red cells are young cells, normally about 8% of the red cells. The reticulating is best demonstrated by staining with brilliant cresyl blue and is not seen with Wright's stain.

It would seem as if different cases of pernicious anemia travelled along with different levels of bone marrow threshold. Exactly how it alters the prognosis and effectiveness of therapeutic procedures is not clear.

From our studies and those of others, it does seem that certain young elements, often taken to indicate stimulation or regeneration of the marrow, do not always indicate stimulation, or at least a favorable sign for the patient.

An apparent difference between an altered threshold and pure stimulation is to be found in the fact that evidence of the former may be seen to develop or increase rapidly, following some procedure, as transfusion or splenectomy, while definite evidence of pure stimulation is not seen for some days, following a stimulative procedure. However, we must realize that we may have all degrees of stimulation and altered threshold occurring at the same time. For example, following splenectomy we see not only stimulation, but what appears to be a favorable and permanent type of altered threshold. With a marked and typical stimulation following transfusion, there occurs within 24 hours a rise in the polymorphonuclear neutrophile count. In about two days the number of platelets begin to rise, and reach their height in 3 to 5 days more, then falling somewhat, but remaining at a higher level than before, as do the polymorphonuclears. At about the time the platelets begin to rise, or a little later, the reticulated cells begin to rise, and reach their height in 3 to 6 days, and then gradually fall as the necessity for the abnormally rapid bone marrow activity ceases. In some instances there occurs a diminution in the reticulated cells before they begin to rise. A similar marrow reaction is to be seen after the stimulus caused by direct hemorrhage in man and recently studied in dogs by Drinker.[10]

An unusual, though clear cut, example of altered threshold was seen in a case that chronically exhibited 5 to 8% of blasts, with few polymorphonuclears and platelets which, following transfusion, exhibited within a few hours about 40% of blasts and no particular rise in the other bone marrow elements. Similar less striking instances were seen after exercise in this patient, as has been observed in dogs by Drinker.[10]

Cases that improve rapidly are the ones that show the picture of marked stimulation, though it should not be lost sight of that a similar picture may occur in the presence of excessive red cell destruction, but owing to this destruction the red count does not rise. The cases that improve more slowly usually maintain with the rising hemoglobin and red count a higher polymorphonuclear and platelet count. In such cases the rate of the rising count does not demand any special excess of young red cells,—the reticulated cells,—so that they do not appear in particularly increased numbers. Some cases with lessening of the erythrocytic destruction, or by a very slowly reacting marrow may, perhaps, become slightly improved without particular alteration of the output of the bone marrow factors. However, the higher the polymorphonuclear count, not associated with complications, and the higher the platelets, the better is the regenerative power of the marrow. These two factors are especially valuable in judging the regenerative or reserve power of the marrow in pernicious anemia. The platelets are particularly significant, and seem to be the best single indicator of the activity of the marrow in this disease, for no marked improvement occurs unless they show a definite increase. The other elements may increase considerably and the platelets slightly or not at all, but then only a mild or slight improvement occurs.

Some cases showing inactivity of the marrow may later have good remissions with increased activity of the marrow. Hence a temporary depression of the marrow is not as bad a sign as a permanent depression.

It is the level of the hemoglobin rather than the red count that coincides with the well-being of the patient. It is somewhat obscure how the pigment metabolism proceeds, but in studying hemopoietic activity it is important to observe the relation of the hemoglobin to the red count and young red cells. It would appear as if lower color indices were associated with greater compensating activity of the marrow.

TYPES OF THE DISEASE.

The effect of therapeutic procedures will depend on the duration and type of the disease, and these in turn depend upon the degree of reserve power of the marrow and the degree of erythrocytic destruction. Judgment about the results of therapy are difficult on account of the natural tendency for remission in the disease. We cannot expect to see and do not see favorable results in cases exhibiting signs of exhaustion or marked depression of the marrow. Cases with marked pouring out of all the marrow elements, likewise, usually die shortly. We also are inclined to believe that cases that chronically exhibit more than a few blasts, associated with an altered bone marrow threshold, usually do poorly, excepting certain splenectomized cases.

It is noteworthy that those types of pernicious anemia that do well spontaneously are the ones that are usually the most favorably affected by therapeutic procedures. The following types of the disease, that merge one into the other, can be recognized.

1. Cases of an acute nature, that rapidly progress to a fatal termination in a few months —the degree of blood destruction varying.

2. Cases with marked or fair remissions, and usually with considerable or marked hemolysis, the hemolysis being greater in relapses, and sometimes not abnormal in remissions. The remissions may be quite sharp or gradual, one or even fifteen in number.

3. Cases that show chronically a considerable degree of hemolysis, with relatively slow and usually never very striking remissions, but do not have, except after years or terminally, very serious relapses. These usually have enlarged spleens, and are affected more favorably by splenectomy than ever seems to occur spontaneously. These cases appear to approach the condition known as acquired hemolytic jaundice.

4. Cases of a chronic nature that slowly progress downward, though interrupted by mild remissions. This type merges directly into Type 5.

5. Cases of a continuous chronic nature that very slowly progress downward with more usually no, or only very slight remissions associated with little increased red cell destruction and a sluggish inactive marrow.

These two latter groups may be termed myelotoxic in contrast to those of groups 2 and 3 that are more hemolytic with perhaps relatively less bone marrow involvement. The duration of the non-acute cases is usually one to four years, though it may be fifteen years. Those of a more continuous nature usually live fewer years than those of a relapsing type. Cases of type 3 are apt to have a rather long course of the disease.

In general, it is the older patients that belong to the myelotoxic type and the younger that belong to the hemolytic types. For example, no case of the chronic continuous type occurred in 13 patients under 40 years of age; 8 of these were cases that had sharp marked remissions. While of 32 patients over 50, of whom 12 were over 60, but 5 had marked remissions, none of whom were over 60 years of age. Of these 32 cases 14 were of the chronic continuous type, of which 7 were over 60.

It has been our experience that usually cases with both enlargement of the spleen and liver (not due to cirrhosis of the liver, passive congestion, etc., but due to pernicious anemia) had more or better remissions, and were better while they lived, so that they ran a more favorable course of the disease, than those without such enlargement. Such cases are also more apt to be more benefited by splenectomy and in some cases without excessive hemolysis, by transfusion than other cases. This enlargement occurs more usually in the cases showing considerable hemolysis, with which it is associated, and is greater later than earlier in the course of the disease. There were 50 cases showing definitely no enlargement of both the spleen and liver. Fifty per cent. of these never had any marked improvement after the disease began and 18% showed marked gains. On the other hand, 40% of the 20 cases with definite enlargement of particularly the spleen but also the liver showed marked gains, and but 15% showed no significant improvement.

Thus we may note that in general the younger patients are more capable of benefit from increased bone marrow activity and an amelioration of the hemolytic factor.

GENERAL TREATMENT AND USE OF ARSENIC.

There is no known treatment that cures pernicious anemia. Occasionally one finds reports of cures, but such instances apparently represent either very long remissions or incorrect diagnoses. Rest in bed and freedom from mental worry and strain, fresh air and sunlight and good hygiene are important, and to be combined with whatever other treatment one employs as well as a suitable diet and treatment directed towards the achlorhydria, cardiac weakness, etc. Such measures are clearly indicated; they prolong life and aid to bring about a remission. Oral septic foci should be removed. Just how far one should go in removing possible septic foci in the internal organs, as the gall-bladder, appendix, etc., as recommended by Percy,[11] is at present open to question.

The use of arsenic by mouth in various forms, preferably as Fowler's solution, has for some time been the chief special treatment for pernicious anemia, and more recently has been used intramuscularly and intravenously. How arsenic is beneficial, is disputed in the literature. It may act as a protective substance to the red cells against hemolysis,[12] though it does not affect the urobilin output.[13] It also may act as a stimulus to the marrow,[13, 14] though in larger amounts it appears to cause destruction of this tissue. Our observations on bone marrow activity following the administration of arsenic preparations are at present inconclusive. However, arsenic does not seem to cause any very rapid marked stimulation. Salvarsan may at times cause curious bone marrow reactions, as especially shown by increases of certain large mononuclear cells, as reported by Evans,[15] similar instances of which we have seen. Some consider arsenic,[16] especially salvarsan, or one of its substitutes, a valuable and helpful remedy in this disease; others consider that it has no considerable influence.[17] We are inclined to agree with the latter view from our past and present experience with 15 cases (9 not in this series of 96) treated with 3 to 10 small (.1G.-3G.) doses of salvarsan and numerous cases treated for longer or shorter periods with Fowler's solution, and some with atoxyl and sodium cacodylate. Of course, if syphilis is suspected, salvarsan is indicated. We can see no harm arising from arsenic therapy, and in view of a rather prevalent idea that it is helpful, it may be well to use it combined with other therapy, as we have done in some cases. It should, of course, not be given at a time when one is trying to observe the effects of some other therapeutic procedure.

Cases have been treated by many other different methods with varying success, as by cholesterin, extracts of marrow, glycerine, hemolysins, serums, thyroid extracts, etc., etc. Also procedures to cause increased oxygen want, which stimulates the bone marrow, have been recently used,[18] and may in the future have a definite place in the therapy of this disease.

TREATMENT BY TRANSFUSION AND SPLENECTOMY.

The use of transfusion and splenectomy in the treatment of pernicious anemia is relatively new, but seems, from the experience of others and ourselves, to give rather better and more constant remissions than any other methods of treatment. It is, however, possible to parallel the most marked improvement by transfusion and splenectomy, or by either alone, with a case which has had no treatment. However, cases treated by these measures are more likely to show consistent temporary improvement and be more comfortable while they live than without such treatment. How much life is prolonged by these measures is uncertain, and it is possible that when a large series of statistics is available that actual prolongation of life will be found not to occur, except perhaps in certain very limited groups of cases.

Of the 96 cases of pernicious anemia studied, there are 115 observations that may be used for the study of therapeutic procedures. This is because the effect of two different procedures was observed on 19 cases at a time so remote from each other that there could be no confusion of their effects. Forty cases were treated either by no special therapy or by arsenic in some form, and will be taken to represent "untreated" cases. There are suitable data for study of 46 different cases transfused in one relapse of each case. Seventy transfusions were given, not counting the transfusions associated with or given at any time after splenectomy. Nineteen cases were splenectomized, with one operative death in a case with a red count below 1,000,000. Ten cases were treated by exposure of the spleen to the roentgen rays. Only four of the splenectomized cases can be considered selected cases, and the transfused cases represent distinctly non-selected cases.

There was inside of a few weeks definite improvement beyond a simple filling up with transfused blood in about 50% of the 46 cases that were transfused. Very slight improvement occurred in about 13% more, so that about 63% of the transfused cases showed at least some improvement beyond that due to the volume of transfused blood; while 84% of the 19 splenectomized cases showed definite improvement following the operation. The degree of the improvements following transfusion or splenectomy averaged greater than the improvements in the "untreated" cases. In a time proportionate to that in which the transfused and splenectomized patients showed definite or slight improvement, only about 35 to 40% of the 40 untreated cases showed any improvement at all, though it is to be noted that about 80% of any pernicious anemia cases at some time in their course show some definite improvement. There is no conclusive evidence that the duration of the improvements or clear-cut remissions are any longer in the transfused and splenectomized cases than in the untreated ones. However, there were but 7.5% of the untreated cases that showed such marked and rapid gains in the same period of time (about a month) as 30% of the splenectomized and transfused cases did (18% of the transfused and 46+% of the splenectomized). The untreated cases formed a similar number of the different types of the disease as the splenectomized and transfused cases, except that all four cases of the acute type occurred in the transfused group. It is to be noted that the transfused group contained more unfavorable cases than the untreated group, and that 10 of the transfused cases died within a month, while but 4 of the untreated cases did so.

Such figures are suggestive in regard to the frequency, rate and degree of remissions.

TRANSFUSION.

Transfusions[19-27] for pernicious anemia may be employed in relapses to relieve symptoms, and with the hope to bring about a remission. They may be given either repeatedly every few (3 to 7) days, gradually filling the patient up so as to keep him in a better condition, and thus hope to give the marrow a chance to act more normally, as may be accomplished in a different condition, namely, the aplastic anemia of benzol poisoning, or they may be given one to three times some 7 to 14 days apart, with particularly the idea of inducing a stimulation of the marrow directly or indirectly, or in some manner turning the factors of altered blood formation and destruction to a favorable balance, so as to inaugurate a remission. Transfusion as such has been shown not to influence the excretion of the blood-derived pigments, though in remissions following transfusion these may become lessened as the hemolysis lessens.

In most instances transfusions bring about immediate symptomatic benefit due to the increased amount of blood in the patient. Such benefit is, however, only temporary, and lasts about as long as the transfused blood is held, unless, of course, a remission of some sort is inaugurated. If the patient is exhibiting an excessive hemolytic activity, the transfused blood is at times apparently rapidly destroyed, so that even no real temporary benefit occurs. The beneficial temporary effect is seen in the patient's general sense of well-being, with improvement of appetite, mental symptoms, and often lessening of fever, etc. With the remissions following transfusion, the improvement in the general condition, gastrointestinal symptoms, etc., though the achlorhydria often still persists, is the same as occurs in spontaneous remissions. Transfusions for only temporary alleviation of symptoms may be repeated as often as considered practicable, and may be used when the patient or friends so desire. The desired result to be seen with transfusion is not so much its temporary filling-up effect, but its inauguration of a remission. We have had our cases transfused with particularly this in view. If there has been no result with one transfusion, we have, when possible, had the procedure repeated 1 to 4 times, usually about 9 days apart, for no result with one transfusion does not mean no result with a second. A different donor has nearly always been used for the same patient for each transfusion. There is to be found in the literature[19, 20] an idea that some donors' blood is more capable of inducing a successful reaction in a given patient than others. We are doubtful whether this is true. No noteworthy effects were seen with a donor having polycythemia.

Of the 46 cases treated by transfusion, 9 showed, following this procedure, evidence of a marked bone marrow stimulation, and made very rapid and marked gains in their general condition, and usually in weight coincident with the rising hemoglobin, red count, polynuclear count and platelets. Two of these cases made similar gains following transfusion in another relapse. These cases were all of a definitely relapsing type of the disease, which they had had from 3 months to 6 years, usually 1 to 3 years. In two it was the first relapse, in one the second, in four the third, and one the tenth. One responded only after two transfusions, the others after one. It may be noted here that 6 out of 12 transfusions in 4 similar but splenectomized cases were followed by rapid, marked remissions.

Twenty cases showed a definite but usually slow gain following the transfusions. There was no definite relation of the results to the duration of the disease. One had had the disease under 6 months, five between 6 months and a year, eight between 1 and 2 years, seven between 2 and 6 years. In these cases there was usually at least an eventual increase of some or all the factors, indicating activity of the marrow. In some there were definite increases of reticulated red cells with or without increases of other bone marrow elements an appropriate number of days after transfusion. In others the blood appeared to become maintained at a slightly better level without calling forth any definite increased numbers of the young red cells, in contrast to what occurs with beginning active rapid regeneration. Temporary increase of the polymorphonuclears alone after transfusion in cases previously showing a relative lymphocytosis is not necessarily indicative of future improvement. The studies on the blood elements, hemoglobin, etc., are in some instances obscure and will not be further discussed.

Five of these 20 cases showed a slow progressive improvement, that eventually became marked, 3 having two transfusions, and 2 one. Four belonged to the definite relapsing type of the disease, and 1 was of the type having mild remissions. It may thus be seen that about 30% of the transfused cases had marked improvement, 9 cases rapidly, 5 slowly.

Of the other 15 cases [these cases received from one to three transfusions], 8 showed a moderate or mild improvement, and 7 but a slight improvement.

Such slight improvements were often rather temporary. By improvement following transfusion, we refer here to the fact that there was at least some clinical improvement and some evidence of blood improvement that was present at a time after transfusion, which was not to be wholly attributed to the volume of transfused blood.

Of the 8 cases showing moderate or mild improvement, 6 belonged to a type having relapses, more usually relatively mild relapses, and 2 to a chronic more or less continuous type. Four of the 7 showing but slight improvement were of a chronic continuous type and 3 of a relapsing type.

Seventeen cases showed no improvement following transfusion, beyond the benefits associated with the temporary increased amounts of blood; 10 had one transfusion only, 3 had two, 2 had three, and 2 had four. Both of those having four died two weeks after the first transfusion, one of whom had in a previous remission a marked improvement following a transfusion in New York. Of these 17 cases, 3 died within five days after the first transfusion, 3 within two weeks, and 4 within about a month.

Of the 6 patients dying within two weeks, all were very sick patients before transfusion. It is not felt that the transfused blood had anything to do with their death, except in two instances where the transfusion reaction perhaps hastened it. Two of these 6 cases had the disease less than six months, and were apparently of an acute type. Four were of a relapsing type. A great activity of the blood-destroying factors was evident in three. Three showed a terminal alteration of bone marrow threshold, as was especially evidenced by many blasts of all types; two of these three cases also showed a high lymphocytosis.

Two of the four cases dying between two weeks and about a month after their first transfusion, and not sooner than three weeks after their last transfusion, were of an acute type, and one of the type showing numerous, very slight remissions, and one was of the continuous type. Both of these last two patients showed enough evidence of bone marrow exhaustion to have secondary purpura hemorrhagica, which is associated with marked diminution of the platelets.[28]

Four of the eleven cases not dying within a month belonged to the continuous type of the disease and had some evidence of an exhausted marrow. Two died within six months, one was in the same condition at the end of two months, and one is now living a year after splenectomy, which procedure, however, caused very little change in the patient's condition.

Two of the remaining three cases that were not improved had evidence of great activity of the hemolytic processes at the time of the transfusion, so that the transfused blood appeared to be rapidly destroyed. One of these cases was splenectomized later, with definite benefit. Other instances where the transfused blood was apparently rapidly destroyed were seen in some of those cases dying shortly after transfusion and in some of those that improved.

The last case to be accounted for had a continuous downward course for about a year and a half, and two transfusions had no effect, though six months later a marked remission occurred, following the beginning of roentgen ray radiations of the spleen.

It may thus be seen that the cases most apt to receive benefit from transfusion are the same as those most apt to have the best course of the disease without treatment. Patients who have had or may be expected to have definite remissions, though the disease has lasted several years, receive the most benefit. While older patients, and those with a chronic prolonged course, with no or but mild remissions, or those with marrow exhaustion, often fail to respond well, the acute forms are not favorably affected, nor are some cases with excessive hemolysis. Though a remission may, perhaps, be inaugurated by transfusion, its duration and character are apparently not different from that which may be expected at that time in the disease.

The figures given may, perhaps, give an unfavorable aspect of transfusion. However, it is to be noted that there is no other procedure that can be so successfully employed for the immediate relief of symptoms, and that after one transfusion the patient frequently requests another; and that patients, in some instances, can be kept alive, if they so desire, by repeatedly filling them up. Also, some very sick cases have shown remarkable gains following transfusion. It has been our impression that transfusion is often, for the time being, actually life-saving in such patients, though it is to be recognized that similar cases occasionally spontaneously have good remissions.

Transfusion, besides giving temporary symptomatic benefit and at times being temporarily life-saving, may inaugurate a remission, even in cases that appear unlikely to remit. Transfusion may allow at once the patient to rest more comfortably, eat more, sleep more, etc., and, either directly or indirectly, permit increased marrow activity, sometimes rapidly, more usually slowly. It thus seems that an opportunity for transfusion ought to be given every case, provided the expected result in a given case is understood by the patient, and it appears that there are many instances where the procedure seems distinctly desirable and of much benefit.

THE AMOUNT OF BLOOD TO TRANSFUSE AND THE TIME TO TRANSFUSE.

The amount of blood that is the most desirable to transfuse is a question that has not yet been definitely settled. Some have advocated large amounts (1000 to 1500 cc.), while others small amounts (100 to 200 cc.). We have had our cases transfused with usually about 600 cc. We have, however, advised large transfusions, and at times very small ones, and have seen definite benefit with amounts from both 150 and 1500 cc. In cases that have a very low red count and low hemoglobin, it is often necessary to give massive transfusions, because in such instances one must give enough blood to increase the amount in the patient's blood stream, while attempting to initiate a remission. Likewise, when a transfusion is done to check hemorrhage associated with marked diminution of the platelets, it is necessary to transfuse a large enough amount of blood to contain enough platelets to check the hemorrhage.[29]

It is quite possible that large transfusions are in some ways harmful, as suggested by Vogel.[26] They may cause actual marrow depression, which we have seen occur following transfusions and which has been experimentally demonstrated in rabbits by Robertson.[30] Following many transfusions, one often first sees a diminution of the reticulated cells before the rise associated with active stimulation. In three instances we have seen a temporary marrow depression twenty-four hours after a transfusion, and lasting about three days, severe enough to allow a mild purpura hemorrhagica to develop, though two of these cases later had an excellent remission. The other died within a month. Such a purpuric manifestation is probably different from the more rapidly appearing petechiae that occur as one of the forms of unexplained transfusion reactions.

We are inclined to believe that there is a desirable amount of blood to be transfused in pernicious anemia, and that this amount is small rather than large. On the other hand, some cases can do well with an amount that may be harmful to others. The ideal may be to give small amounts repeatedly and often, and at a time when the blood elements are not extremely low, though repeated transfusions may develop some type of substance in the patient's body that makes further transfusions dangerous. Such a method is also often impractical, so that if but one, or possibly two, transfusions can be given, 450 to 700 cc. is recommended. This is the amount that can usually be taken from the donor without causing him any real discomfort, and is enough for the patient to obtain at least symptomatic relief.

In regard to the time to transfuse patients, no set rules can be laid down. It is probably wise not to transfuse if there is a marked blood crisis of some kind taking place. In view of the evidence that anemia *per se* is deteriorating on the various organs of the body, it is desirable to keep the patient above the level of a very marked anemia, and yet not to transfuse when the patient is relatively well. It is certainly wise not to wait until the patient becomes essentially moribund and needs a massive transfusion, though no case is too sick to be able to receive benefit from this procedure. In other words, transfusion is to be preferably done relatively early rather than late. By so doing it is possible that remissions could be more often induced, and by thus letting the patient remain in a relapsed state a shorter time, that life would be prolonged.

CHOICE OF THE DONOR AND TRANSFUSION REACTIONS.

The donor for transfusion should be a healthy individual with a negative Wassermann reaction, and one whose red cells are not agglutinated by the patient's serum, and preferably one whose serum does not agglutinate the patient's cells, so that both donor and patient belong to the same isoagglutination group.[31] A donor should never be used whose cells are agglutinated by the patient's serum, though if this is done it may not always result in an untoward reaction. When the donor is selected by proper, carefully made isoagglutination tests[25-32] there will occur not only no isoagglutination reaction in the patient, but no isohemolytic reaction because isohemolysis does not occur except when isoagglutination does.

In the course of 92 transfusions* in cases of pernicious anemia we have seen three isohemolytic reactions due to improperly made tests.† Further tests showed these all occurred in patients belonging to isoagglutination group IV (Moss), and the donors to group II or III, a combination where the patient's plasma or serum agglutinates, and thus may hemolyze the donor's red cells. This isohemolytic reaction begins while the blood is being transfused. The patient becomes restless, complains of pain in the lumbar region of the back, exhibits altered respiration, and often gastro-intestinal symptoms. Such symptoms are in contrast to the perfect calmness that the recipient should show. Shortly after the first symptoms, the patient has a chill and appears to become toxic as the temperature rises to often 104° F. Later there occurs hemoglobinuria with diminished amounts of urine and often temporarily high blood pressure. Within twelve hours jaundice develops, due to the liberated hemoglobin being changed to bile pigments. The severity of the reaction is over within usually eighteen hours. Most cases that have this reaction get well, while some especially sick cases appear to be unable to overcome the hemoglobin and other toxic products liberated from the red cells.

Isohemolysis probably hastened the death of one of our cases. This was a very sick patient. Another had a slow but marked remission following a second transfusion ten days later, while the third had a rapid and marked remission that began with all the evidences of marked bone marrow stimulation about a week after the unfortunate reaction. There is considerable evidence that products of blood destruction are influential in stimulating the marrow, and perhaps the fact that cases having ioshemolytic reactions may receive a marrow stimulation, as others have also reported, further substantiates this view.

Very rarely certain reactions may appear to be of an isohemolytic nature, though the donor is properly selected. Such reactions, however, are due to other causes. Thrombosis is a complication, not a transfusion reaction, that may occur following this procedure.

Besides the isohemolytic reactions which can be avoided by proper tests there are other reactions that occur following transfusion, though usually of a much milder nature. These reactions cannot be foretold and are not ascribed to any special method of transfusion. The cause of these is unknown, though many interesting possibilities have been discussed by Satterlee and Hooker[23] and others. As they suggest, it would seem as if some of these reactions were dependent on the amount of initial coagulation changes that may have taken place in the transfused blood. Novy and DeKruif's[34] recent experiments with anaphylotoxin are significant in this connection. We are inclined to believe that the operator who alters the factors of transfused blood the least will experience the fewest reactions, but that such alteration of the blood is not the cause for all these reactions.

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* Most of these transfusions were done by the different house surgeons of the Massachusetts General Hospital. Most of them were given by the Vincent paraffin tube method.

† We did not personally make these three tests.

In the other 89 transfusions[*] there were 55 that caused no reaction and 34 that caused some reaction, 20 of which occurred inside of 3 hours and 14 of which were simply delayed temperature elevations. These non-isohemolytic reactions may be briefly summarized as follows:

Eleven consisted of a sharp rise, within an hour, of the patient's temperature of two degrees or more above its previous level, and over 100.5° F., often 104° F., which fell to normal usually within 24 hours and often inside of 12 hours. Three of these cases had a chill.

Four caused very definite jaundice, with at least slight toxic symptoms. A temperature rise of at least 2°F. occurred in 3 cases and a chill in one. These cases had previously received transfusions without any subsequent reaction. They will be referred to later.

Five caused temporarily, within two hours, skin eruptions, 4 urticarial in nature, associated with a rise in temperature in three and a chill in two instances. In the fifth case the skin eruption was petechial in nature and the temperature rose only one degree to 100°F.

Fourteen transfusions caused no immediate reaction, but the patient's temperature began to rise gradually about 6 to 20 hours after the procedure to usually about 101°F., rarely to 105°F. and remained elevated usually 12 to 24 hours and was never accompanied by other symptoms than those of fever. Four of these rises were only a degree and in cases that had not had temperature. Five of these reactions occurred in one case.

Such delayed temperature rises are probably not to be considered of the same nature as the more rapid reactions that follow transfusion, and are often not referred to as transfusion reactions. We have observed perhaps some, but no very definite relation between these different types of transfusion reactions and the condition of the patient. It does seem that some cases are more apt to have certain types of reactions with any donor than other cases.

Only about 6% of the above reactions were severe enough to cause any uneasiness in the minds of those who cared for the cases. One of the reactions probably hastened the death of one very sick patient. The two other similar reactions referred to below, that occurred in extremely sick patients, did not hasten their death. Also none of the other non-isohemolytic reactions caused more than temporary discomfort. The case in which death was hastened received in twelve days 3 transfusions of about 400 cc. each. Following the first two there was no reaction, while following the third, from the same donor as was used for the first, the patient complained at once, particularly of headache, shortly vomiting occurred, the patient became toxic, the temperature rose, and marked jaundice developed and he died in about 18 hours. No hemoglobinuria occurred. Another sick patient, shortly following a transfusion from a donor whom she had previosuly received blood from without ill effects, developed a similar severe reaction. The reaction consisted of a chill, temperature 102.5° F.; gastric symptoms and rapidly marked jaundice developed. Very slight hemoglobinuria occurred. Death occurred two weeks later. A similar, much less severe reaction occurred in a third very sick patient who died 5 days after the fourth transfusion in three weeks.

The isoagglutination tests in these three instances showed no agglutination or hemolysis and we verified them after the reactions in the first two cases. The donors and patients belonged to the same isoagglutination group. Though these reactions may be of some sort of an isohemolytic nature, they are not of the known type. It would seem that they may have been due to the development by previous transfusions of some unknown and unrecognized antibody to the donor's blood. Another, perhaps better, explanation is that the patient's tissues had become saturated with blood pigments due to the red cell destruction during the course of the disease, and the rapid accumulation of pigment from destruction of the previously transfused blood. Hence with further transfusion any pigment liberated by the patient's own hemolytic activity could not be taken care of in a normal manner; consequently the accumulation of such large amounts of pigment in the body allowed a small additional quantity to give rise to toxic symptoms. A similar small amount normally could not do so. The observations referred to below tend to support, but do not wholly explain such a hypothesis.

The case of pernicious anemia that Sellards and Minot refer to in their paper, "The Preparation of Hemoglobin for Clinical Investigations," in this month's *Journal of Medical Research,* is the same one that died in 18 hours after the third transfusion in 12 days. This case showed a greatly lowered tolerance for hemoglobin, similarly as many other cases of pernicious anemia.[5] Following an intravenous injection of 17 cc. of hemoglobin marked toxic symptoms occurred and an intense hemoglobinuria, while two control cases received 20 cc. of hemoglobin and no toxic symptoms or hemoglobinuria occurred.

If we exclude the four slight and delayed temperature rises following these 89 transfusions in pernicious anemia, it is to be noted that these non-isohemolytic reactions occurred in about one third of the instances, a figure close to that given by McClure and Dunn.[24]

Others[19, 23, 35] give smaller figures (9% to 20%) for the occurrence of transfusion reactions, but apparently do not count delayed temperature reactions. Not counting the delayed temperature reactions in our cases, there were 22% of the transfusions that caused immediate reactions. It is possible that more of these reactions occur in primary blood diseases than in other conditions.

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[*] The isoagglutination tests were all properly performed. Usually they were done by the house officers of the Massachusetts General Hospital.

SPLENECTOMY.

a. Its Effect. Splenectomy for pernicious anemia is a therapeutic procedure that has received considerable attention in the past four years. Giffin,[27] Krumbhaar,[36] Percy,[11] Roblee,[37] Lee, Minot and Vincent, [38, 39] among others, and the authorities they quote have reported upon this procedure. Our experience is very similar to that of others and is based on 19 cases,* 15 of which have been reported. The results from splenectomy have not been as great as was first expected and in no way to be compared to the great benefit derived from this procedure in hemolytic jaundice. However, definite improvement follows splenectomy more consistently and uniformly than after any other form of treatment in pernicious anemia. The patients often show marked remissions with red counts over 4,000,000. Splenectomy is in no sense curative, though a more profound change in the blood occurs after splenectomy than by other means. The eventual progress of the disease is not essentially changed by splenectomy, except perhaps in certain younger cases, exhibiting, chronically, considerable hemolysis and enlarged spleens. Whether splenectomized patients live longer, or during the course of their life have more relapses and remissions, cannot be told at present, though it seems rather clear that in many instances there cannot have been more than a slight prolongation of life.

The effect of this procedure seems to be twofold; it not only reduces the red cell destruction, as clearly evidenced by the various tests, and the appearance of the patient within a very few days, but also brings about, by some unknown mechanism, an increased activity of the marrow. This activity may be interpreted as a favorable type of persistent lowered bone marrow threshold combined with temporary active stimulation. Among other features that may be interpreted as an altered threshold are the rapid and persistent appearance of Howell-Jolly bodies, the frequently rapid appearance of blasts and the ease with which they and other nuclear elements appear in relapses following this procedure. Also the rapid and temporary appearance of large mononuclear cells of bone marrow origin, the constant elevation of the polynuclear count and usually of platelets, at least over previous levels, are significant of this altered threshold; as may be the fact that some of the platelets are usually extremely large. Evidence of active stimulation may be seen in orderly rises and falls, first of the polynuclears, then later of the platelets and reticulated red cells. The platelets may reach even five times their normal numbers. Considerable prognostic information is to be obtained by following the blood picture after splenectomy, which we have previously reported on. Some information is also possibly to be derived from observing the degree of decreased fragility of the red cells to salt solution that occurs after this operation.

Quite rapidly, within days after splenectomy and before the red count or hemoglobin rises, one notices as a rule, barring complications, that the patients look better, feel better, and appear less toxic. In some cases the red count and hemoglobin rise rapidly, while in others these factors may not show a definite rise for 3 to 6 weeks. The gains in the general condition occurring before these factors are increased continue as they increase, and the gain in the patient's weight is often striking, though there may at first occur a temporary loss.

Following splenectomy, about 75% of all reported cases have shown definite improvement for three months, and some improvement has occurred in about another 10%. Continued improvement has been seen for six months in between 65% and 70% of the cases, while the cases that have remitted for over a year are few, probably between 10% and 20%. If one considered only selected cases, these figures would be higher.

The operative mortality of reported cases is about 15%, but of the more recent and selected cases it is certainly much lower, about 3% to 5%.

b. Selection of Case for Splenectomy. When splenectomy for pernicious anemia was first done the cases were unselected. The trend now seems to be for a selection of cases, and it is probable that in the future fewer will have their spleens removed. There should be not only selection of the type of case but also selection in the stage of the disease when the operation had best be done.

The following considerations are perhaps helpful in deciding whether to advise splenectomy or not.

It is not indicated in those cases that have evidence of an aplastic marrow or a much exhausted marrow. Likewise it seems that cases, especially with little hemolytic activity, which chronically exhibit signs of a definite altered threshold of the marrow, as particularly told by the continued presence of numerous blasts without alteration in the red count, are not benefited by splenectomy. In many instances older patients and those whose general condition is poor are not desirable cases for splenectomy. Acute cases are a probable contraindication for the operation. Cases that have developed definite spinal cord changes as a rule do not do well with splenectomy, and it is thus not indicated in such cases. Neither splenectomy nor transfusion checks these changes, though some benefit in the symptoms from them may be seen with a rising red count from any cause.

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* We are indebted to Dr. Beth Vincent, who did fourteen of these operations, and to Dr. C. A. Porter, who did five.

The cases that usually do well with splenectomy are those of the more hemolytic types of the disease, especially those with enlarged spleens, occurring more often in the younger than the older patients. The rarer cases, exhibiting, more or less chronically, considerable blood destruction and fairly active marrow, with no increased fragility of the red cells to salt solutions, appear to derive more benefit from splenectomy than occurs spontaneously in this type of case. These cases approach the condition of acquired hemolytic jaundice in which splenectomy is usually markedly beneficial. In the future it is quite possible that such cases will be considered a different condition than the more myelotoxic and less hemolytic types of pernicious anemia, usually occurring in older individuals. In this latter type splenectomy is apparently not as effective, though may be followed by striking remissions.

It appears that cases with the larger spleens and secondarily enlarged livers offer good prospects of benefit from splenectomy. Enlargement of these organs in this condition is associated with increased red cell destruction, so that marked icteric discoloration of the skin without bile in the urine will indicate that especially the spleen is responsible for the blood destruction. Its removal will thus diminish the excessive hemolysis at the same time that it inaugurates increased activity of the marrow.

Some true improvement with transfusion is nearly always an indication that there will be rather more improvement with splenectomy because it induces the strongest desirable marrow changes, while no improvement with transfusion may, but by no means always does, indicate that there will be no marked improvement with splenectomy. Thus better results are usually to be seen with splenectomy in the types of cases that do the best spontaneously. Perhaps the more chronic hemolytic types do better with, than without, splenectomy.

The risk of operation is greater when the hemoglobin is below about 30% and the red count about 1,500,000. Such cases should preferably not be operated upon until they have first been transfused, so as not only to increase these factors but also to improve the patient's general condition. Such preoperative transfusions should be given some days before splenectomy, so that one may observe how the patient responds to such a procedure, and also because there are instances where a combination of transfusion and splenectomy at near to the same time have caused a greater reaction in the patient than was to be expected from either alone. In some instances it is necessary to transfuse at a time closely approximating that of the operation, on account of the patient's hemolytic activity or his condition following the operation.

c. Time to do the Operation. Splenectomy should preferably not be done during a rather rapid down wave of the disease or in a severe relapse. It also had better not be done at a time when there is evidence of any type of blood crisis, for some fatalities have occurred associated with these. The operation is most satisfactorily done when the course of the disease is stationary or the patient is gradually improving.

If the procedure is to be looked upon as simply the best means of inducing a remission, it then seems logical that it should be used more or less as a last resort when other means have failed. However, splenectomy is not a procedure of desperation and should never be done as an emergency. Unlike transfusion, it can be done but once and does not give rapid symptomatic relief. It should be reserved for selected cases in good operative condition, and in a suitable stage of the disease for operation.

It should always be put very directly to the patient, and if he wishes to obtain the best remission that he can, the operation may be done but not urged. Frequently the operation should probably not even be discussed with the patient on account of his age, and the type and character of his condition, etc. Such a serious procedure should be advised only after considering each case carefully and observing it for some time. It does, however, seem that the operation may be advised, explaining fully the situation to the patient or his friends and, in particular, the younger cases with the larger spleens. There is some reason why, if the procedure is to be undertaken, that it should preferably be done early rather than late. This is because many radical measures are more successful early than late. At present no cases have been splenectomized very early in the disease, a time when pernicious anemia is now seldom diagnosed. Some cases operated upon relatively early may have done better than if not operated upon, even though they have had relapses. It is possible, as Balfour[40] suggests, that if we could remove the spleen in the incipiency of the disease, we might be better able to interrupt the course of the disease and the vicious circle of the hemopoietic system. If the patient is willing to take the risks, there seems no reason why the operation should not be done early. It is perhaps wise in the more chronic hemolytic cases to remove the spleen as early as possible, because, by waiting, at least the anemia acts to cause greater permanent changes in the vital organs of the body, and no permanent harm is known to result from removal of this organ in this disease.

TRANSFUSION AFTER SPLENECTOMY.

Transfusion may be given directly after splenectomy, as McClure has done, so as to keep the patient's hemoglobin and red count as high as possible until he can maintain his own blood at this level. In our cases, as in most others, transfusions in splenectomized cases have been given only in the subsequent relapses.

It has been our impression that relapses following splenectomy have tended to occur rather more rapidly than in non-splenectomized cases.

and also when remissions occurred that they were apt to be relatively rapid. It has also seemed to us, as it has to Vogel,[41] as if splenectomized cases perhaps responded to transfusion better than non-splenectomized patients. We have seen some truly remarkable pictures of very marked bone marrow stimulation following transfusion in our operated cases, so that even 50% of the red cells showed reticulation. If there is eventually any good evidence that transfusion is more effective after removal of the spleen, it would be an argument for early rather than late splenectomy. There is at present no clear evidence that splenectomized cases have more relapses and remissions than untreated cases. When a relapse in a splenectomized case has occurred, one cannot at present say, however, that the disease takes any different course than in many other cases.

Five of our patients have been transfused in relapses following splenectomy. Four cases belonged to a definitely relapsing type of the disease. There were twelve transfusions given these patients in ten relapses. Two transfusions in two patients were without any lasting effect, though another transfusion three weeks later in each case was beneficial. Six transfusions in these four cases were followed by rapid and markedly striking remissions, one by a marked but relatively slow remission and three in one case by a moderately rapid remission but of a relatively slight degree. As is to be seen in any case, untreated or treated, the first remissions were usually longer and better than the later ones.

The fifth case transfused after splenectomy was of a chronic type, who had had the disease ten months with one very slight remission before the operation and who showed an unfavorable blood picture. Splenectomy caused no definite improvement. During the past year, since removal of the spleen, he has had five transfusions, three of which were without more than temporary effect and two were followed by a definite but slight remission.

TREATMENT BY ROENTGEN RAY EXPOSURES OF THE SPLEEN.

In view of the fact that removal of the spleen in cases of pernicious anemia is followed rather consistently by improvement, it seemed that one might be able to obtain some result by exposing the spleen to destructive doses of the roentgen rays. Definite improvement by such treatment has been reported[42] in a few cases of hemolytic jaundice. We have, however, seen no improvement in three cases of hemolytic jaundice that have been so treated. These three cases perhaps serve as a control, because splenectomy is so effectual in the disease hemolytic jaundice, to our ten cases of pernicious anemia treated with the roentgen rays.[*] These cases have received 6 to 12 treatments with just under the erythema dose of the roentgen rays. The treatments were given two to four weeks apart to a quarter or a half of the spleen.

Two of the pernicious anemia cases are too recent to afford any data. Two showed no improvement and six showed improvement associated with the roentgen-ray treatments. Three showed marked improvement, two moderate and two slight, though all four of those that have gone six months since ending treatment have relapsed. Two cases that showed marked improvement had, before treatments were begun, definite symptoms due to anemia for one and a half to two years, and never had more than very slight remissions. One of these had previously had no remission after one transfusion.

One cannot say that the remissions have been inaugurated by the roentgen rays. What different doses of these rays, radium, etc., applied to the spleen will do towards benefiting the patient remains for the future to tell us. It is possible that some form of radiations to the spleen may be beneficial in this disease.

SUMMARY.

There is no known treatment that cures pernicious anemia.

From a study of 96 cases and the literature, the treatment of this disease, especially by transfusion and splenectomy, has been considered. Forty of the 96 cases were not transfused or splenectomized.

The first essential for treatment is a correct diagnosis. The diagnosis is not to be made on the blood smear alone and, unfortunately, is seldom made early.

A careful, detailed study of the activity of the bone marrow and red cell destruction is important for prognosis and therapy. Bone marrow stimulation and bone marrow threshold have been discussed. Not only one but all of the three chief elements of the marrow must be studied: the polymorphonuclear neutrophiles, red cells, especially young red cells, and platelets. Observations on the latter are important. Certain elements, often taken to indicate stimulation of the marrow, do not always indicate this, or at least are not always associated with a favorable prognosis. Such elements at times are of bad omen.

It has been pointed out that certain types of pernicious anemia are to be recognized. Those types of cases that do the best spontaneously usually, but not always, receives the most benefit from treatment. Older patients are more apt to have a less relapsing and less hemolytic type of the disease than younger individuals. Cases with enlarged spleens, together with somewhat enlarged livers, when these enlargements are associated with and probably due to hemolytic activity, are apt either to have, or to have had, a more favorable course of the disease than those cases without such enlargements.

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[*] Dr. Merrill very kindly gave the roentgen-ray treatments.

It is important that all cases should have proper general treatment.

Transfusion and splenectomy offer the best means for inducing remissions, though a remission can occur spontaneously as marked as those inaugurated by these procedures.

No case is too sick for transfusion. Transfusion can give rapidly symptomatic benefit. It may also, either directly or indirectly, rapidly or slowly, cause stimulation of the marrow or allow increased activity of the marrow, so that a remission is inaugurated.

The amount of blood to be transfused, the time to transfuse, the choice of a donor, and transfusion reactions have been discussed.

Isohemolytic reactions will not occur with properly selected donors. Other reactions of unknown nature, usually much less severe, cannot at present be avoided. It is suggested that some reactions following transfusion may be dependent upon the fact that the patient has previously received transfusions of blood. Such reactions are, perhaps, associated with a rapid and excessive accumulation of blood pigment in the body.

Splenectomy for pernicious anemia is a palliative operation. It checks the red cell destruction and increases the activity of the marrow. Good remissions follow splenectomy more consistently and uniformly than after other forms of treatment. Splenectomy is reserved for only selected cases in certain stages of the disease. It is a serious procedure, is not to be urged, but at times may be advised, provided the patient understands that its effect is only temporary. The cases of pernicious anemia that approach the disease hemolytic jaundice are the most suitable ones for splenectomy.

By means of transfusion and splenectomy we believe that patients do better and can be made more comfortable while they live, and that in certain instances they may perhaps live longer than without such treatment. Probably when transfusions are begun relatively early, so that the patients never remain very anemic for long periods, the best ultimate results will be seen.

Roentgen-ray exposures of the spleen have at present shown no definite beneficial effect.

REFERENCES.

This is not meant to be a complete bibliography of the subject.

[1] Moffitt, H. C.: Am. Jour. Med. Sci., 1914, Vol. cxlviii, p. 817.
[2] Schneider, J. P.: Journal-Lancet, 1917, Vol. xxxvii, p. 105.
[3] Robertson, O. H.: Arch. of Int. Med., 1915, Vol. xv, p. 1072 and references given.
[4] Schneider, J. P.: Arch. of Int. Med., 1916, Vol. xvii, p. 32.
[5] Sellards, A. W., and Minot, G. R.: Jour. Med. Research, 1916, Vol. xxxiv, p. 469.
[6] Blankenhorn, M. A.: Arch. of Int. Med., 1917, Vol. xix, p. 344.
[7] Rous, P., and Robertson, O. H.: Jour. of Exp. Med., 1917, Vol. xxv, p. 651.
[8] Robertson, O. H., and Rous, P.: Jour. of Exp. Med., 1917, Vol. xxv, p. 665.
[9] Naegeli, O.: Blutkrankheiten und Blutdiagnostik, 1912, Leipzig.
[10] Drinker, C. K.: In press.
[11] Percy, N. M.: Surg., Gyn. and Obst., 1917, Vol. xxiv, p. 533.
[12] Bloch. Thèse de Paris, 1908.
[13] Robertson, O. H.: Arch. of Int. Med., 1915, Vol. xvi, p. 429.
[14] Stockman, R., and Charteris, F. J.: Jour. of Path. and Bact., 1903, Vol. viii, p. 443.
[15] Evans, F. A.: Arch. of Int. Med., 1916, Vol. xvii, p. 1.
[16] Bramwell, B.: Brit. Med. Jour., 1909, Vol. i, p. 209; and 1913, Vol. ii, pp. 1093 and 2734.
[17] Cabot, R. C.: Modern Medicine, Osler and McCrea, 2d Ed., Vol. iv, 1915, Lea and Febiger.
[18] David: Deut. Arch. f. klin. Med., 1913, Vol. cxi, p. 2.
[19] Ottenberg, R., and Libman, E.: Am. Jour. Med. Sci., 1915, Vol. cl, p. 36.
[20] Archibald, A.: St. Paul Med. Jour., 1917, Vol. xix, p. 43.
[21] McClure, R. D.: Jour A. M. A., 1916, Vol. lxvii, p. 793.
[22] Larrabee, R. C: Boston Medical and Surgical Journal, 1917, Vol. clxxvi, p. 553.
[23] Percy, N. M.: Surg., Gyn. and Obst., 1915, Vol. xxi, p. 360.
[24] McClure, R. D., and Dunn, G. R.: Bull. of the Johns Hop. Hosp., 1917, Vol. xxviii, p. 99.
[25] Brehm, W. V.: Jour. A. M. A., 1916, Vol. lxvii, p. 190.
[26] Vogel, K. M., and McCurdy, U. F.: Arch. of Int. Med., 1913, Vol. xii, p. 707.
[27] Giffin, H. Z.: Jour. A. M. A., 1917, Vol. lxviii, p. 429.
[28] Minot, G. R.: Arch. of Int. Med., 1917, in press.
[29] Lee, R. I., and Minot, G. R.: Cleveland Med. Jour., 1917, Vol. xvi, p. 65.
[30] Robertson, O. H.: In press.
[31] Moss, W. L.: Bull. of the Johns Hop. Hosp., 1910, Vol xxi, pp. 63, and 1911, Vol. xxii, p. 238.
[32] Minot, G. R.: Boston Medical and Surgical Journal, 1916, Vol. clxxiv, p. 667.
[33] Satterlee, H. S., and Hooker, R. S.: Jour. A. M. A., 1916, Vol. lxvi, p. 618.
[34] Novy, F. G., and De Kruif, P. H.: Jour. A. M. A., 1917, Vol. lxviii, p. 1524.
[35] Lindeman, E.: Jour. A. M. A., 1916, Vol. lxvi, p. 624.
[36] Krumbhaar, E. B.: Jour. A. M. A., 1916, Vol. lxvii, p. 723.
[37] Roblee, W. W.: Jour. A. M. A., 1915, Vol. lxiv, p. 796.
[38] Lee, R. I., Minot, G. R., and Vincent, B.: Jour. A. M. A., 1916, Vol. lxvii, p. 719.
[39] Minot, G. R.: Bull. of the Johns Hop. Hosp., 1914, Vol. xxv, p. 338.
[40] Balfour, P. C.: Jour. A. M. A., 1916, Vol. lxvii, p. 790.
[41] Vogel, K. M.: Jour. A. M. A., 1916, Vol. lxvi, p. 1012.
[42] Jona, G.: Policlinico, Jan. 9, 1916 (summary in Jour. A. M. A., 1916, Vol. lxvi, p. 696).

DISCUSSION.

Dr. Beth Vincent, Boston: My experience with the methods of treatment in pernicious anemia is confined to transfusion and splenectomy. I should like to speak very briefly of certain points in connection with these two procedures: in the first place, as to the selection of donors for transfusions, and next, in regard to the reactions that one may encounter after transfusion in pernicious anemia. These cases are never such great emergencies but that the compatibility of the bloods of donor and recipient may be determined before transfusion. Not to do so is, I think, almost inexcusable.

The best way to make certain of the compatibility of the blood, the easiest way, certainly, is to determine to which one of the four blood groups the donor and recipient belong. Knowing the blood group, select a donor of the same group as the recipient or, if this is impossible, a donor belonging to Group 4, since it is now very generally agreed that a member of Group 4 is a universal donor and may be safely used with any recipient. Hemolysis sometimes follows the mixture of incompatible bloods. I have never observed a hemolytic reaction between a donor and recipient of the same blood group.

During an ordinary transfusion the patient should be calm and quiet and have a sense of well being. In a transfusion resulting in hemolysis the signs are usually unmistakable. These signs are immediate and secondary. The immediate signs are observed during the transfusion. The patients complain at once of severe pain in the back or in the abdomen. They have gastro-intestinal disturbances and may vomit on the table. There is dyspnea and a weak, irregular pulse. Under these circumstances one should stop the transfusion at once, no matter how carefully the donor and recipient have been tested. The secondary signs appear within six, twenty-four or forty-eight hours. They are chills, a high fever, the dark urine of hemoglobinuria and jaundice. In most of the cases hemolysis is not fatal, but if it happens to a very sick patient I think it may add just enough to the burden of that patient to bring about a fatal result. After any transfusion in pernicious anemia there may be a reaction which manifests itself by chills and temperature but which does not interfere with the result. Most of my transfusions have been done by means of the paraffin tube. I have done a few by the citrate method and it seemed to me that a larger percentage of those done with the citrate method were followed by fever and perhaps a chill.

Transfusion does not cure pernicious anemia. It relieves the patient of symptoms due to extreme anemia and may inaugurate a remission of considerable duration. This method of treatment is used in two ways. Transfusions of small amounts of blood are given at frequent intervals to keep the red count at a satisfactory level or a single transfusion of a larger amount—600 cubic centimeters—is made in a relapse when it seems unlikely that the patient will have a spontaneous remission. The latter procedure seems to me the more practical. Each case of pernicious anemia is apt to require several transfusions and, as suitable donors are not always easy to get, it is best to reserve this procedure until needed for the relapses that are sure to come in every case. Except in the terminal stages, a transfusion is not contraindicated by the severity of a relapse. Marked remissions have been observed after transfusions in relapses which threatened to be fatal.

While transfusion is the best treatment for a relapse, splenectomy should not be attempted in this stage of the disease. The remissions following splenectomy are often more marked and sometimes longer than those obtained in any other treatment. The mortality is not high if one does not operate in a relapse. This is the rule at the Massachusetts General Hospital where we have had but one operative death in these cases. If the patients are not in satisfactory condition these cases are transfused from three to ten days before splenectomy. Splenectomy is most clearly indicated in the cases of pernicious anemia in which the bone marrow is active and capable of stimulation, and the destruction of red blood corpuscles is excessive as shown by the patient's yellow color, and the increased urobilin in the stools and duodenal contents. Cases with an enlarged spleen and jaundice form the most hemolytic type of pernicious anemia and resemble the cases of chronic hemolytic jaundice in which removal of the spleen gives excellent results. No matter how responsive the bone marrow, the destructive activity of the spleen is a serious handicap in these cases.

If splenectomy is done in every case of pernicious anemia that presents itself, I am quite sure that the patients will be dissatisfied with the results. These cases should be carefully studied by a medical man and the cases selected for operation according to the indications. A series of cases done under these conditions should give results that will repay the patients for the risk and discomforts of the operation.

DR. R. C. LARRABEE, Boston: I want to say a word in appreciation of the work of Drs. Lee and Minot and their associates at the Massachusetts General Hospital, on pernicious anemia. In the last few years much has been contributed to our knowledge of this common and serious disease, and in this work the authors of the paper have had an important share. Yet in spite of these advances, there are still great gaps in our knowledge of the disease. Interest at present centres about the operation of splenectomy, and most of the recent work had to do with the enormously increased destruction of corpuscles in the spleen and liver. Although this hemolysis is believed to be the primary factor in the disease, we are not justified in saying that pernicious anemia is hyperspleenism in the sense that exophthalmic goitre is hyperthroidism. In the latter condition, thyroidectomy gives permanent relief and we are justified in assuming that the thyroid is primarily at fault. In pernicious anemia, however, removal of the spleen merely produces temporary remission, and does not always do that. Relief is not permanent, and relapse invariably occurs. There is some hemolytic agent or agency at work. We do not know what it is, but it originates or *may* originate outside of the spleen. Splenectomy does not eradicate it, but does remove a wheel in the machinery with which it works. The machinery is sooner or later repaired and the work goes on as before.

In the practical application of splenectomy, we are apt to find ourselves on the horns of a dilemma. On the one hand, though results seem to be about as good when operation is performed late in the disease as when it is performed early, it is not advisable as a last resort, when the patient is failing rapidly. The operative mortality is then high and the chances of benefit small. On the other hand, a palliative operation in a remission is an absurdity—unless it can be proved that the remission will be lengthened and made more perfect, which cannot at present be affirmed. I believe that the operation finds its best field in a rather large group of cases, which are neither in relapse nor remission—patients who drag along in a state of invalidism with the hemoglobin, say, between 40 and 50 per cent. Operation gives a good chance of bringing about a remission without excessive risk.

I have had a small series of transfusions—perhaps a dozen cases—in most of which the patient was losing ground under medical treatment. They fall in three approximately equal groups. In all, the downward course of the anemia has been interrupted by an abrupt upward jog, representing the addition of normal blood. In about a third of them the advance of the anemia has been promptly resumed, so that the benefit has been very brief. In another third the initial improvement has been followed by further progressive gain, and the remissions thus initiated have struck me as being remarkably long and perfect. In the third group the advance of the anemia seems to be checked; the initial gain is more or less perfectly sustained for a short period; but no real remission occurs. These cases may perhaps be favorable ones for splenectomy, which would not have been possible except after the transfusion.

DR. J. B. BLAKE, Boston: I feel I have but little right to discuss this paper; when I was asked to do so, it was from the standpoint of operative experience, and at that time I hoped to have a considerable personal experience. I should like, however, to emphasize two or three points.

I congratulate Dr. Minot on his very excellent presentation of the subject. It should not be forgotten that the suggestion of splenectomy was made not by a surgeon, but by a medical man. That is a matter of some importance. The only other instance I think of in modern medicine was the recommendation of Dr. Reginald H. Fitz, who recommended that all cases of acute appendicitis be subjected to immediate surgical interference.

It is conceivable that splenectomy may take, in the future a larger rôle than it seems to me to occupy at the present time. It is also possible, if every case of pernicious anemia was studied early enough to make a very early diagnosis, that our control over the disease might be greater. We are talking, of course, not of cures but of remissions, and it may be possible that in the small number that are ultimately going to be benefited, a remission may be effected frequently enough to create practically what might be called a cure.

As to the operation itself, I cannot quite accept as general, Dr. Vincent's extraordinarily good figures as applied to mortality in splenectomies. In the Mayo Clinic, where the operation has been done for one thing or another some one hundred and fifty times, the mortality at present approximates ten per cent., and that includes Banti's Complex and other conditions in which the general bodily state of the patient is more favorable than it is in pernicious anemia. I cannot believe that the mortality through the country, as the operation is done by the average surgeon, is much below fifteen per cent. I should think an eventual mortality of five per cent., which is a low mortality for major surgery under conditions of anemia of any sort, would not be reached for some little time.

As to the suggestion made and prominently pushed by one surgeon that not only should the patient have the spleen removed, but also the gallbladder and appendix, I cannot believe that there is any indication for such a proceeding. The operation for splenectomy is serious enough in itself, and only to be recommended after very careful and continued study by the laboratory expert and the clinician, and the surgeon.

Finally, the question as to the rôle of splenectomy in pernicious anemia is not to be settled by the experience of a single surgeon, or of many surgeons for a single year, but by the results of many surgeons, in many carefully studied cases, over a period of many years. Perhaps ten years from today, we shall know whether splenectomy can cure any case of pernicious anemia, or whether it will help all cases, or whether it is only one method which may help a little to prolong life, but not to preserve it indefinitely.

Dr. George R. Minot: I have noticed this morning in the last issue of the *Journal of the American Medical Association* that Sydenstricker and others at the Johns Hopkins Hospital have reported more striking instances than ours of transfusion reactions that may be due to the development of immune bodies to the donor's blood.

I think that the statistics for the operative mortality of splenectomy in general are higher than those for the operative mortality for splenectomy in pernicious anemia. This may be because in the latter condition the spleens are more easily removed.

Book Reviews.

Eye, Ear, Nose and Throat. A Manual for Students and Practitioners. By Howard Charles Ballenger, M.D., and A. G. Whippern, M.D. New second edition, thoroughly revised. Illustrated with 180 engravings and 8 colored plates. Philadelphia and New York: Lea and Febiger. 1917.

The first edition of this manual was reviewed in the Journal of Dec. 20, 1900, nearly seventeen years ago. It is of the same size as before, but of course has been largely re-written. It covers a wide field in a small space, and is well arranged for reference. It is a posthumous tribute to the value of Dr. Ballenger's contributions to his special field in medicine.

Cerebellar Abscess. By Isidore Friesner, M.D., and Alfred Braun, M.D., F.A.C.S. New York: Paul B. Hoeber. 1916.

This monograph by two New York otologists, deals *in extenso* with the etiology, pathology, diagnosis and treatment of cerebellar abscess, 98% of whose occurrence is otitic in origin. The anatomy and physiology of the cerebellum are briefly outlined as a basis for the neurological knowledge essential to cerebellar diagnosis. The descriptions of the etiology, pathology and symptomatology are based chiefly on the reports of 86 cases collected from the literature since 1906. The work is illustrated with an interesting double page frontispiece showing the cerebellum as described by Vesalius in his "Corporis Humani Fabrica" in 1555, and by eight other full-page plates and sixteen text cuts from original drawings and photographs made by the junior author. The chapter on prognosis and treatment describes and illustrates operative technic. There is an excellent alphabetic bibliography of 106 titles. The book should prove a valuable contribution to the literature of the subject.

A Chart of Food Values. By Paul W. Goldsbury, M.D. New York City: E. C. Bridgman. 1917.

Dr. Goldsbury has devised a chart of food values, showing the principal elements of common foods. Each food is represented by a square, printed in colors to represent the proportions of its component parts. Its caloric value is printed below. There are 48 foods thus portrayed. The information here given in so graphic and simple a manner ought to be common knowledge in every household.

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ALLERGIC AND AUTOSEROLOGIC THERAPY.

There is, perhaps, no more fascinating field of medicine than that opened by the studies in anaphylaxis—the sensitiveness of the organism to certain foreign agents,—bacteria, toxins, food products or other materials,—especially after repeated contact. It has long been understood that some individuals had an idiosyncrasy for certain foods, substances or poisons. This food sensitiveness or allergy manifests itself in various ways. There are the symptoms of acute poisoning, such as vomiting, abdominal pain, diarrhea, swelling of the lips, tongue, pharynx, and esophagus, besides certain spasmodic effects in the bronchial tubes. The cutaneous eruptions are, perhaps, more striking and suggestive of these symptoms. Urticaria of various forms and degrees and angioneurotic edema are very common accompaniments. Then there are the more chronic skin manifestations, such as eczema, erythema, etc. The chronicity of these skin diseases is due, in all likelihood, to the continued action of these food agents, although the allergic effect is not severe enough at any time to produce the acute symptoms of extreme prostration and collapse. This food sensitiveness seems to depend upon the protein element of the food and sometimes upon the globulin element, particularly the water soluble protein and proteoses. It may be, however, that it is some substance intimately connected with these elements. The anaphylaxis is due either to a lack of some protective element in the body against the action of these protein elements, or to an extreme degree of sensitiveness to them, quite in excess of the protective power of the body. It has been held that this sensitiveness was due to a splitting up of the offending protein into component and toxic elements when in contact with the sensitive organism; and because there is a lack of this protective element which would, under other circumstances, have prevented this untoward splitting. When the offending proteins were in food elements not in the regular dietary, the cause was comparatively easy to discover, and the remedy obvious. But when the offending proteins were included in the regular dietary, and when that dietary was, as it should be, a mixed one, the problem was far more difficult. To separate and to feed each food article separately until the offending one manifested itself by causing symptoms is a method that is tedious and generally impracticable. The method now pursued with food is the same technic as that pursued in the usual anaphylactic methods,—as with tuberculin, for example. A von Pirquet borer is used to abrade the skin, and the food extracts rubbed in one after another, until the one that causes a reaction is reached. The reaction manifests itself by the production, in from 5 to 15 minutes, of an urticarial wheal. Almost any food can be toxic to some individuals. Where they result in persistent skin conditions, which do not yield to treatment or recur, the reactions must be tried out to see whether or not an allergic sensitiveness is at the bottom of it. For testing purposes there have been made commercially various stock food "vaccines." For treatment these substances are put up for internal administration, and given in increasing doses until there is a desensitization. It would seem that desensitization by the skin route would be the more rational method, although the dosage would have to be minute and very carefully planned. However, it must not be understood that all food toxic effects are due merely to individual sensitiveness, nor that all chronic or repeated skin manifestations are allergic in origin. It must not be understood that the treatment of all skin affections, other than the specific skin lesions, will yield to dietetic or allergic therapy. Proper diet will affect all pathological conditions only as proper diet contributes its share in keeping up the health and in maintaining vital resistance.

More recently many of the obstinate skin diseases have been successfully treated by some observers with autogenous serum. Gottheil, Willock and others report favorable results, while other observers are more skeptical. The most striking results of autoserum treatment have been in the postponement of recurrences, and in the mildness of these recurrences. Whether the principle in this form of treatment is the same as the treatment of hemorrhagic conditions in the new born with foreign sera, is hard to say. Some of the workers have found that better results were obtained, especially in psoriasis, when the autoserum treatment was combined with the usual chrysarobin treatment. The skin condition was cleared up more quickly. The method followed in this treatment is to withdraw about 100 cc. of blood, centrifuge after clotting, and to reinject into the circulation the remaining 25 to 45 cc. of serum.

For the present these two elements in the particular form of toxemia manifesting itself so frequently by skin conditions—that is, allergy and autogenous serum treatment—have come to stay. The mistake will be made in laying all on one or the other theory. Until more is learned on the subject, the most rational method in treatment will be the determination of food idiosyncrasies, and treatment accordingly,—autogenous serum treatment in appropriate cases, and the continuance of the usual but not obsolete methods of treatment heretofore obtaining.

DURATION OF CONTAGION IN SCARLET FEVER.

The colder months of the year usually bring a considerable rise in the morbidity from scarlet fever, and again emphasize the difficult problem of determining cause and effecting prevention. Yet scarlet fever, although serious and having a high mortality, is not nearly as contagious as measles or whooping cough, for example. In the latter the degree of contagion on direct exposure is sometimes as high as 99%, whereas in scarlet fever it is rarely above 37%. The susceptibility to scarlet fever becomes markedly less with the rise in years, and in children is probably at its lowest ebb between 12 and 14 years. Although the specific germ of measles has not been isolated, much work has been done with the virus obtained from the blood. But the specific cause or the specific virus of scarlet fever is still undiscovered. The strains of streptococci and staphylococci found in scarlet fever or associated with the complications do not carry out the postulate for specific organisms. Nor do the so-called scarlet fever bodies found in the skin appear to be more than the products of a severe inflammation. As to the method of contagion, it does seem that here also the disease is spread by contact with the discharges directly from the patient or from objects in contact with them. It is the usual droplet method of infection. Moreover, it is just as likely, although undemonstrated because the specific germ has not yet been isolated, that there is a carrier population which is responsible for the spread of the disease in epidemic proportions. The carrier may be one himself immune to the disease, or having had it in the past in severe or in mild form. Many cases of scarlet fever are undiscovered because they have no constitutional symptoms, but they are just as likely to transmit severe infections as the seriously affected patients. In this disease, more than elsewhere, is the infection likely to be conveyed by objects in contact with the patient, such as toys, clothes, books, etc. Disinfectants do not have much effect on the virus, but heat destroys it, and must be used to destroy discharges from the body or for the sterilization of materials in contact with the patient. In scarlet fever, as in other infectious diseases, the air-borne route of infection, while not disproven, is no longer accepted. Contagion must be effected by means of discharges from the mucous membranes of the nose, mouth and throat, as well as the urine in nephritic complications. As for the desquamatory skin as a bearer of infection, there is still much doubt. In measles, desquamation is no longer held to be a period of contagion. Contagion does not outlast the catarrhal stage, and the scales have nothing to do with the spread of this disease. Rational quarantine does not now outlast the catarrhal stage. In scarlet fever, on the other hand, there is still considerable hesitancy in absolving the desquamating scales from guilt in the spread of this disease. If there is any contagion, probably the primary desquamation carries more of it than the secondary. The problem that must yet be solved with respect to the desquamation in scarlet fever is whether it is responsible for the return cases. The small number of the return cases and the generally lower degree of contagiousness are not consistent with the long period of desquamation being continually infectious. Perhaps it would be more plausible to say about desquamation that the period of desquamation is an index of the period of contagion, rather than the cause of it. The inflammation which causes the skin eruption and the angina are the same processes. Until there is complete healing, the discharge does not stop, whether it is a discharge of desquamating débris in the skin, or the non-identifiable débris discharged from the mucous membranes. In other words, as long as there is desquamation there is infective discharge from mucous membranes. The healing of the mucous membranes of the nose, mouth and throat may take many weeks, and is the reason for the maintenance of such long quarantines. This quarantine should last in ordinary or in uncomplicated cases from five to six weeks. Until more is known concerning the causation of this disease or the nature of the virus, the actual period of contagion cannot be determined and the quarantine had best be maintained as long as possible.

THE SIGNIFICANCE OF ORAL SEPSIS.

The progress in dental research and in dental therapeutics has been so marked that this period may well be called the dental epoch in medicine. But the development of this science is too one-sided, in that there is a strong leaning to prosthetic rather than to therapeutic dentistry. There is too much development of mechanical skill and too little scientific conception. Good dentistry must be, first of all, a proper conception of the pathological significance of oral conditions. The presence of decayed teeth, infected gums and diseased bone is not nearly so bad as after the filling or crowning of such areas, because what had previously been an open and perhaps draining wound, is now converted into a closed but, nevertheless infected cavity. This danger in dental work must always be kept in mind if disaster is to be avoided. Although the swallowing of pus from infected teeth may in itself account for the digestive disturbances accompanying oral conditions, this is the very least of the evils of oral sepsis. A great many rather vague medical conditions and more definite evidences of toxemia are directly traceable to oral infection. Mainly, however, one has to deal with definite toxemia the direct result of absorption of bacterial toxins found in the mouth. Most of the vague conditions classed as rheumatic have their inception in the mouth. Acute rheumatic infection, with the endocardiac complications, is either metastatic infection from foci in the mouth or the bacteria gain entrance to the circulation therefrom. Chronic rheumatoid arthritis, the etiology of which was heretofore completely in the dark, is now definitely ascribed to toxemic effects from mouth infections. The teeth, perhaps even more than the tonsil, act as means of entrance to the circulation for many bacteria. Many streptococci, particularly the streptococcus viridans, the pneumococcus, the non-pus-forming diplococcus of Connellan and King, as well as the endameba buccalis, are found in the mouth. It is not surprising, therefore, that pneumonia, abscess of the lung, pyemia, etc., are conditions that may be expected to follow on untreated mouth infections.

Moreover, the continued toxemia from oral sepsis affects the glands of internal secretion. Disturbances in balance of the whole endocrinous system may follow. These effects are most patent in the thyroid gland, where overstimulation by the toxins may produce symptoms of hyperthyroidism. Likewise, glycosuria, and even true diabetes mellitus, may follow as a result of the toxic irritation of the endocrinous system. High blood pressure and the resulting circulatory disturbances are caused by the same toxemic conditions, affecting directly, or indirectly through the glands of internal secretion, the vegetative nervous system controlling the vasomotor system.

The consistency with which medical military officers have been rejecting recruits seems to show that they realized the true significance of oral infections. The resistance of recruits suffering with oral infection is low, and their susceptibility to disease and hardship very high.

It must be remembered that the mouth can represent almost the greatest amount of broken tissue surface through which bacteria may gain entrance to the body. A thorough mouth cleaning is perhaps a much more rational means of beginning the treatment of disease than even the much overdone intestinal cleaning-out. There is a very tangible danger in the treatment of oral sepsis, and that is in the use of strong antiseptics, which corrode or devitalize healthy tissue, or in the laceration of tissue by careless instrumentation. However, the lymphatic glands of the neck catch and stop much of the infection from the mouth and lessen what would otherwise be a tendency to much more systemic effects of oral sepsis.

MEDICAL NOTES.

Chicago City Council Ordinance for Control of Venereal Diseases.—The ordinance relating to the control of venereal diseases which was passed by the City Council of Chicago, June 29, 1917, reads as follows:

The ordinance,—

(*a*) declares syphilis, gonorrhea and chancroid to be contagious, infectious, communicable and dangerous to the public health;

(*b*) requires physicians, managers of hospitals and dispensaries, and all other persons who give treatment for venereal diseases, to mail, within three days of the first visit of the patient, to the department of health, a card stating the age, sex, color, marital condition, and occupation of the diseased person, nature and previous duration of the disease, and the probable origin;

(*c*) requires physicians to hand to patients afflicted with venereal disease, at the first examination, a circular of information and advice furnished by the department of health and also a copy of this ordinance;

(*d*) requires the physician to ascertain from the patient whether a physician has been consulted heretofore and, if so, immediately to inform the physician or person who previously treated the patient. Should the physician, or person previously consulted, fail to receive such notice within ten days after the last appearance of such venereally diseased person, it shall be the duty of such physician to report to the health department the name and address of the patient;

(*e*) requires the commissioner of health to institute such measures for the protection of others against venereally diseased persons as he is already empowered to use to prevent the spread of other contagious, infectious or communicable diseases;

(*f*) provides that all reports shall be confidential and inaccessible to the public;

(*g*) holds parents of minors, having venereal disease and living with their parents, responsible for the compliance of such minors with the requirements of the ordinance;

(*h*) imposes a fine of not less than $25 nor more than $100 for each offense, on persons who violate, neglect or refuse to comply with these provisions.

London Death Rates in September.—Statistics recently published show that the total death rate of London in September, 1917, was only eleven per thousand inhabitants living. Among the several districts and boroughs the lowest rate was 6.6 in Woolwich, a southern suburb, and the highest was 14.9 in Bermondsey, a populous southern slum.

Lobar Pneumonia.—According to the experience of a life insurance company which has made a study of its mortality record for the past six years, lobar pneumonia causes more deaths than any of the other acute infectious diseases.

Although prevalent at the early ages, lobar pneumonia is not essentially a disease of early childhood. When it does occur in young children it is very frequently fatal. The disease reaps its greatest harvest at the ages over 65. At these ages it is one of the chief causes of death. The insurance figures, furthermore, show that the colored people have a much higher mortality rate than is found for the whites. This is true for both sexes and for every period of age. Pneumonia has a higher death rate for the male sex than for the female.

The Metabolic Unit.—Volunteering and the draft reduced the numbers of those associated with Dr. N. B. Potter at the Metabolic Unit recently established at the City Hospital, New York, so that it has been temporarily closed. Dr. Potter has transferred the work to Santa Barbara, California, where he is spending the winter, having made arrangements for its continuance at the Cottage Hospital. This Metabolic Unit is undertaking the study and treatment of gout, Bright's disease and diabetes, and the expenses are defrayed by contributions from a number of his patients and friends, as well as by a generous addition from the Carnegie Foundation.

Birth and Death Rates in Belgium.—The following report of the birth and death rates in Belgium appears in the London *Lancet:*

The death rate in Belgium has greatly increased in the last two years, and there has been a large decrease in the birth rate. While the number of births in the Brussels district in 1913 was 6417 (17 per 1000 of the population), and the death rate 13.7, in the first six months of 1915 the birth rate was 14.3 and the death rate 14 per 1000. In the corresponding period of 1917 there were 3311 births (8.5 per 1000), and the death rate had risen to 19.3.

Valuable Statistical Study Made Possible by the War.—The following extracts from the statement of Dr. J. A. Murray, director of the Imperial Cancer Research Fund, in the Fifteenth Annual Report of the Fund, 1916-1917, will be of interest to those engaged in the study of cancer statistics:

"The importance which has always been attached by statisticians to the age-constitution of populations in which cancer mortality has to be studied, receives striking justification by the results recorded in the 78th Report of the Registrar-General (1915), published this year. The withdrawal of a large number of young men from civil life constitutes a most valuable statistical experiment, showing the effects of a sudden alteration in the age-constitution of a population. . . . The majority of the men withdrawn from civil life are under 35 years of age, and the cancer mortality figures for 1915 show the effects on a population of retaining the female sex in its normal proportions, while profoundly altering the relative proportions of the males above and below the age at which cancer is an important cause of death. . . The change in the male population is, on a large scale, affecting the whole country, and has taken place abruptly. It is analogous to those minor differences in age-constitution which have been attained slowly in isolated communities, and which go far to account for the phenomena of cancer villages and cancer streets. . . It is obvious that the varying conditions in limited areas at the present time must produce anomalies, and in fact, in some districts the deaths of males from cancer equal, or even exceed, those of females. Without the data necessary to effect the corrections for age and sex, crude death rates for such limited areas can only be misleading and may cause unnecessary alarm and distress.

"Undue importance should not be attached to the interruption in 1915 of the steady yearly increase of cancer mortality, the first since 1907. The conditions are abnormal, and as was pointed out in the Annual Report two years ago, the dislocation and diminution of the civil medical service by war conditions, may well affect the fidelity with which the national mortality figures reflect the absolute incidence of such a disease as cancer."

WAR NOTES.

Reserve Supply of Physicians.—The Mayor's Committee on National Defense of New York has, through its committee on hospital and medical facilities, obtained figures showing the number of first-year students enrolled in a majority of the medical colleges of the country this year. The bearing of these figures on the continued supply of medical graduates in the event of a war of long duration are worthy of consideration. Among the seventy-six schools which recorded their figures there was an average increase in enrollment over the previous year of 16%. Among individual schools, those showing an increase of registration included the University of California with 35%, and Columbia University College of Physicians and Surgeons with 42%. Both Yale Medical School and Harvard Medical School show a decrease, the former 22% and the latter 11%. Washington University Medical School also shows a decrease of 22%. Johns Hopkins University Medical Department is about the same as in previous years.

Orthopedic Work in England.—The following notice regarding the work of Major Joel E. Goldthwait, has appeared in *The British Medical Journal:*

"Major Joel E. Goldthwait, M.R.C., U.S.A., has returned to Europe, bringing with him from the United States forty-two medical officers, who will be distributed through the British orthopedic centers and later drawn for American orthopedic hospitals in France. They will receive training in British hospitals while serving under the American officers who were members of the first orthopedic unit brought over by Major Goldthwait in June last. When, after this training, they are drawn to the American service another group will be sent from the United States to take their place, and so on in successive groups. In this way a large number of positions will be filled for the work under the British director of military orthopedics by well-trained surgical assistants. The training of these younger men will fall upon the American orthopedic surgeons, while at the same time they will help to supply Sir Robert Jones with a large staff to meet the expansion of the orthopedic service. In addition Major Goldthwait is accompanied by three officers commissioned in the American Sanitary Corps, who will be employed in the establishment and development of the American curative workshops."

Posthumous Honor to Medical Student.—Second Lieutenant H. F. Parsons, of Bristol, England, who died of wounds received in battle, was awarded posthumously the V.C. for most conspicuous bravery. At the commencement of the war he was studying medicine in Bristol University.

Return of Serbian Commission.—The commission appointed by the American Red Cross to study methods of relief in Serbia will return to this country about Dec. 1. Dr. Frederick T. Lord and Dr. Eugene A. Crockett of Boston were members of the unit.

Death of Dr. G. P. Howe.—In a recent issue of the Journal was printed an account of the death of Dr. G. P. Howe, killed in action in France. The daily press has recently printed the following letter giving further details:

"British Red Cross.
18 Carlton House Terrace, S.W.I.
Capt. G. P. Howe, 10th Royal Fusiliers, fr. R. C. M. C.,

Dear sir: We beg to forward you our first report, which we have just received, with regard to the above officer.

Our informant, Sergt. W. Booth, 10th R. Fusiliers, returning to England on leave, gives us this information:

'This was in the rear of Polygon Wood. We were stopping a counter-attack. Capt. G. P. Howe was killed by shell. He was wounded slightly before, but he carried on. I saw the body after and helped to bury him. There was a military funeral, the American flag was used, and he was buried at Godezonne Farm with a cross on the grave.' "

New Medical Appointments for French Service.—The following appointments have been made by Surgeon-General Gorgas:

Director-general of surgery, Maj. John M. T. Finney, formerly of Johns Hopkins Hospital; director of laboratory, Lt.-Col. Joseph F. Silver; director of skin and venereal surgery, Maj. Hugh H. Young, formerly of Johns Hopkins.

Majs. Finney and Young volunteered their services to the government and were given commissions in the reserve corps of the medical department.

Tuberculosis in Army Camps.—It is stated that a small percentage of men in training in the army camps have showed tuberculosis symptoms, about four hundred in all. Every soldier who shows the slightest indication of having been infected by this disease is immediately discharged from the camp, and his name and address are reported to the health authorities of his home state.

War Relief Funds.—On November 24 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$299,966.00
Surgical Dressings Fund	139,146.26
War Dogs' Fund	2,008.25

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Nov. 24, 1917, the number of deaths reported was 216, against 263 last year, with a rate of 14.58, against 18.04 last year. There were 33 deaths under one year of age, against 37 last year.

The number of cases of principal reportable diseases were: diphtheria, 107; scarlet fever, 36; measles, 55; whooping cough, 46; typhoid fever, 3; tuberculosis, 62.

Included in the above were the following cases of non-residents: diphtheria, 25; scarlet fever, 3; typhoid fever, 1; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 8; measles, 1; whooping cough, 2; tuberculosis, 21.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 4.

Hospital Bequest.—By the will of the late Mrs. Evelyn O. Weston of Boston, the Children's Hospital receives a gift of $5000 and the Convalescent Home of the Children's Hospital receives a share of a trust fund.

New Salem Hospital.—The new hospital at Salem, Mass., was opened for inspection on Nov. 17, and will soon be ready to admit patients. The hospital will accommodate 150 patients. It consists of a group of buildings made up of the main building, an operating building, domestic building, heating plant, and a coal pocket with a capacity of eight hundred tons, and plans have been drawn and the site set aside for a nurses' home.

The main building faces the south, and terraces and open balconies are connected with the various wards. On the first floor it has rooms for the trustees, offices and library, and other conveniences for the administration department; the west wing has the men's surgical ward and the east wing the women's surgical ward, while directly above these are the medical wards and two isolation wards for contagious cases. On the third floor are the maternity ward and private rooms for patients. On the fourth floor will be the nurses' rooms. The operating building is connected with the main building by a passage; the domestic department is connected with the main building by a passage and has a kitchen with the latest devices, including a refrigerating plant.

Boston Tuberculosis Association.—The annual meeting of the Boston Association for the Relief and Control of Tuberculosis was held at 3 Joy Street, on Nov. 22. Besides the routine business there were addresses, as follows: Dr. John F. O'Brien, chairman board of trustees, Boston Consumptives' Hospital, "The Development of the Boston Consumptives' Hospital from the Standpoint of the Trustees"; Dr. Edwin A. Locke, chief of visiting medical staff of Boston Consumptives' Hospital, "Work of Boston Consumptives' Hospital Proper"; Dr.

Cleaveland Floyd, director of out-patient clinic, Boston Consumptives' Hospital, "Review of Eleven Years' Work of the Out-Patient Department of the Boston Consumptives' Hospital"; Mrs. Anna M. Staebler, secretary of committee on health in industry, "Preventive Value of Industrial Nursing."

Obituary.

WILLIAM CALDWELL STEVENS, M.D.

William Caldwell Stevens, M.D., died in Worcester, October 17, 1917, after an acute illness of one day only, aged 62.

He was born in Barre, Mass., December 16, 1854, the son of Charles Emery and Caroline E. Caldwell Stevens. His father was for many years registrar of probate for Worcester County, and in the family residence at 24 Boynton Street Dr. Stevens had his legal home from his majority to his decease—nearly a half century.

Young Stevens was graduated from the Worcester High School in 1872, and in that year entered Amherst, from which college he received his degree in 1876.

Following an early bent of mind, he spent the enusing year in The Normal Art School of Boston. The next year he taught the High School of Dudley, and the two years subsequent at Cushing Academy in Ashburnham. Entering Harvard Medical School in 1879, he was graduated therefrom in 1882.

He served an interneship in the Rhode Island Hospital, and subsequently, as ship-surgeon, voyaging to Madeira. He then served as *locum tenens* in Ashfield, in which town he was so well liked that he was formally asked to settle there, but his sense of honor and medical etiquette forbade his accepting the invitation, and he opened an office on Pearl Street, and later on Pleasant Street, Worcester, where he paid special attention to diseases of the nose and throat.

He became secretary of the Worcester District Medical Society in 1887 and served a three-year term.

Failing health led him to give up his office for a time and he gradually drifted to the pursuit of art as a painter of landscapes, for which profession he had long had a strong desire and in which he finished his career.

Among the many notable artists Worcester has given the world in the last two generations, Dr. Stevens was, in the opinion of competent critics, one of the best. He knew colors, and all of his studies possess brilliant charm in quality of tone and draftsmanship. The rolling hills and fertile valleys of Worcester County were his inspiration. A perspective, showing a background of slate-blue mountains, with blue sky overhead, seemed to enthuse him most of all. He went to his great out-doors in any weather, and so the landscape of this vicinity has found an interpretation at his hand in every mood of the seasons' turning.

The joy he felt as he settled into his sketching-stool and fixed his easel beside the freshet-brooks of spring, in the birch thickets and oak groves of summer, or among the snow-clad hills of the drear and melancholy days of fall and winter, are all revealed in these sure and rapid transcripts; and in them he has been able, as Tolstoi has said "to pass his emotion to the others."

George O. Ward, M.D.,
For Worcester District Medical Society.

Miscellany.

WAR WORK OF AMERICAN MEDICAL WOMEN.*

By Eliza M. Mosher, Brooklyn, N. Y.

The second annual meeting of the Medical Women's National Association, Dr. Bertha Van Hoosen of Chicago, President, was held in New York City, June, 1917. In view of the pressing need of physicians and surgeons in the war zone and in the devastated districts of Europe, a War Service Committee was appointed by the Association to deal with the situation. This body created an Executive Committee, with defined powers, of which Dr. Rosalie Slaughter Morton was unanimously elected chairman. Dr. Morton's selection for this post was a wise one. The Serbian government had bestowed upon her a decoration for her service in that country. In France special privileges had been given her to inspect and study the French hospitals, and after returning home from foreign duty she has still kept in close touch with the work.

Mr. Leo Schlesinger, of New York City, placed at the disposal of the committee a suite of rooms in his office building, 637 Madison Avenue, admirably suited to its purpose, and there, early in June, the committee was installed, and intensive work began. Before the committee had completed its organization, Dr. Franklin Martin, chairman of the General Medical Board of Washington, asking for an outline of its plan of work. This outline, which Dr. Morton presented in person, received the unanimous approval of the board, and Dr. Morton was appointed a member of it and chairman of a committee of nine women physicians from different parts of the country, who were selected from a list of twelve submitted to Dr. Martin.

This committee of women physicians of the

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*A résumé of the first quarterly report of the Chairman of the Women's Hospital Committee to the Medical Women's National Association.

General Medical Board may be regarded in the light of a congressional committee, its constituency being the women physicians of the United States. If the latter wish to have force and efficiency, organization is necessary. This committee of nine members is not permitted to increase the membership of the General Medical Board; obviously, therefore, it could not encompass the extensive work now going forward under the American Women's Hospitals, which, it is hoped, the general coöperation of women throughout the country will make even more extensive and thorough, and consequently of more value to the general board. We are now in a position to supply the data necessary to supplement that on the cards sent out from Washington, and on file there.

Copies of the outline prepared for the General Medical Board were laid before Col. J. R. Kean, director of the Department of Military Relief of the American Red Cross and the Surgeon-General of the Army, General Gorgas. They both expressed the greatest interest in and approval of the work. General Gorgas said that if the war continued for any length of time, the services of every woman doctor in the country would doubtless eventually be needed.

To anticipate this need, the plan of work, with registration blanks, was mailed to 5000 medical women, asking them to enroll. On October 6, at the time the first quarterly report of the American Women's Hospitals was issued, 115 women had registered as follows:

I, Women's units, 150; II, women's units to Allies' armies, 110; III, service in established units, 103; IV, maternity units to devastated regions, 84; V, village practice, 25; VI, for service in any of the above five, without choice, 110. The registration blanks are still coming in, and it is hoped that every woman physician in the country will record herself as being willing to serve her country in its hour of need.

In September the Red Cross asked for two units of women doctors to go immediately to Roumania. Their departure has been delayed for diplomatic reasons, incident to the situation in Russia. There are also in readiness forty doctors, who may be called within the next thirty days, and units have been arranged which can be mobilized within a few hours.

The American Women's Hospitals' flag and proper insignia, designed by Miss Brenda Putnam, a niece of that brilliant pioneer among women physicians, the late Mary Putnam Jacobi, has been adopted. The flag is blue and white; the drooping wings, the symbols of the American Women's Hospitals, are grouped around a shield bearing the name "American Women's Hospitals." The pins of bronze are sheltering wings, denoting protection and comfort, with the emblem of the various branches of the service placed upon them.

Open meetings of the American Women's Hospitals were held every Thursday afternoon throughout the past summer, and will be continued indefinitely. These meetings, presided over by Dr. Morton, or in her absence by Dr. Emily Dunning Barringer, the vice-chairman, have been of great interest, not only to the members of the organization, but to the general public.

Inspiring speeches by friends of the organization, and officers, doctors and nurses returned from the front have been a feature of these meetings. One of the most interesting of these was the address made by M. Liebert, the French Consul-General at New York.

An important branch of the American Women's Hospitals is that of the A. V. A. (American Volunteer Aid). This body was formed after the British V. A. D. (Volunteer Aid Department), and is in a thriving condition. Those wishing to join are given forms on which must be entered all data concerning non-medical women who wish to be laboratory assistants, ambulance drivers, stretcher-bearers, interpreters, dietitians, clerks, etc. A number will be needed in the units already in readiness. These lay assistants have a distinctive uniform for both identification and protection.

The Surgeon-General of the army has expressed his willingness to place in base hospitals, as contract-surgeons, women physicians as anesthetists, radiographers, and laboratory workers at a salary to be arranged by contract, and not to exceed $1800 per year. The need for laboratory workers is so great that the American Women's Hospitals have opened courses in this branch at the Women's Medical College of Pennsylvania; Women's Hospital, New York; and at the Research Laboratories of the New York City Board of Health. In them courses will be given to college women who have already studied chemistry and biology, in order to fit them, at a nominal expense, to become laboratory technicians, and to assist our physicians.

Any physician connected with laboratories which offer such courses in the different parts of the United States, and women wishing to apply for this training are requested to take up the matter immediately with the National Chairman of Laboratory Work, Dr. Martha Wollstein, No. 1, West 81st Street, New York City.

The Chairman of the Committee on Army Hospitals in the home zone, both for acute and convalescent cases, is Dr. Mary Almira Smith, 33 Newbury Street, Boston, Mass. The American Women's Hospitals have in Boston, two hospitals in readiness for convalescent cases and several others near New York. Its Women's Army General Hospital of New York, which has recorded its personnel and equipment in the War Department at Washington, has been told by Surgeon-General Gorgas that it will be notified when this is needed, and that it has the same status as all other army hospitals in the home zone.

The Women's Committee of the General Medical Board has two meetings, July 29 and September 29. A registration card was sent to the women physicians of the United States, with a view to ascertaining how many would be willing to serve in base hospitals as contract-surgeons, radiographers, laboratory workers and dressers of wounds. These cards are now being filed in Washington for reference in case need arises to place women in base hospitals, to release men for field hospital service.

The following are the regulations regarding contract practice:

1. Contract-surgeons do not receive pensions, except by special act of Congress.
2. The Government pays for transportation, quarters, heat and light, the same as furnished the first lieutenants.
3. There is no additional pay for foreign service; the contract specifies where the service is to be, and the amount to be received for this special service.
4. $1800 a year is the maximum, the minimum being whatever agreed to for the particular service to be rendered.
5. The amount is regulated by agreement; the surgeon states his price and the Government accepts or rejects; or *vice versa.*
6. The immediate superiors are the commissioned officers, of whatever rank in command at the station where the contract-surgeon serves, even although they be only first lieutenants.

The Surgeon-General's office expressed an interest in knowing how many women wished to become members of the Army Reserve Corps, and a letter was sent by the General Medical Board Committee of Women Physicians to the presidents of medical women's organizations, asking an expression of preference for this service, but comparatively few made their offer of war service absolutely contingent upon their becoming *officers* in the Army Reserve Corps.

It is the intention of the Medical Women's National Association to continue the work of this War Service Committee until the end of the war, if the need for it continues to exist.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR OCTOBER, 1917.

General Prevalence.—The 4292 cases of communicable diseases reported during October show a considerable increase over the September total of 3004 and the October, 1916, total of 3227 cases. This increase of 1065 cases over the October, 1916, total is confined chiefly to diphtheria and measles.

There were 1152 cases of diphtheria reported for the month, an increase of 557 cases over the corresponding month last year. This brings out the seriousness of the diphtheria situation, for the prevalence of the disease has been increasing since early summer in the greater part of the State.

Anthrax.—Eight cases of anthrax were reported during the month. Five persons contracted the infection from five separate lots of China cow hides, two from China or India goat skins, and in one case the source of infection is unknown.

Diphtheria Carrier.—During the month four cases of diphtheria occurred among the pupils of a single schoolroom "somewhere in Massachusetts." Culturing of the pupils in this room disclosed two positive cultures. One was from a pupil who had a very mild attack of the disease, and the other was from a pupil who had not been sick recently, but who had diphtheria in August, 1916. A virulence test and a counter-virulence test, using the diphtheria bacilli from the throat of the latter pupil, showed the organisms to be virulent. Thus a chronic diphtheria carrier was found who had the organisms in his throat fourteen months after having had the disease. The occurrence demonstrates once again the efficiency of conscientious culturing of the throats of school children.

Lobar Pneumonia.—There were 152 cases of this disease reported in October, a marked increase as compared with 80 cases reported in September. Of these 152 cases, 23 were reported from Boston, the remaining 129 cases having a state-wide distribution.

Poliomyelitis.—Eleven cases of poliomyelitis were reported from ten widely separated communities.

Typhoid Carrier.—During the month one typhoid carrier was located who was apparently responsible for five cases of typhoid fever this year, and undoubtedly was the source of infection for cases in previous years. The carrier denied ever having had typhoid fever and has worked for several years on a milk farm. This year the farm on which he worked supplied six families, and typhoid fever cases occurred in four of the families.

Diseases on the Premises of Milk Handlers.—During the month four cases of scarlet fever were reported on a farm, producing milk that is shipped to Boston. As it was impossible satisfactorily to isolate the case, this milk supply was shut off.

EPIDEMICS AND OUTBREAKS.

Diphtheria.—An outbreak of 16 cases was reported from Great Barrington. Investigation showed that practically all attended the school in the Housatonic section of the town.

In North Attleboro 5 cases of diphtheria were reported in September, and an epidemic of 33 cases followed in October, being chiefly confined to one school. This epidemic followed the release of a diphtheria case with only one negative culture. Culturing of the school disclosed three persons with positive throat cultures, one of whom was a teacher. A nurse was employed to aid in the supervision of the cases and to give instructions in quarantine of the homes.

An outbreak of 30 cases of diphtheria occurred in Holyoke, and all but two were found to attend the same school. Cultures were taken from all of the pupils at the school and produced negative cultures for the first two days, but the third time cultures were taken, four healthy carriers were found, two each in two rooms, and in another building the fifth healthy carrier was found.

Amesbury and West Springfield also had school outbreaks of diphtheria, reporting 21 cases and 10 cases, respectively.

In Easthampton 12 cases were reported for the month of October. In one family the disease spread after the appearance of the initial case because the parents objected to the giving of immunizing doses of antitoxin to the children who were not ill. As a result, another case of the disease appeared in this home.

Dysentery.—There were three cases of dysentery reported in the Medfield State Hospital during October, making a total of 60 cases for September and October. Institutional dysentery offers an exceptional opportunity for the bacteriological study of this disease if specimens of feces can be obtained early in the course of the disease. There were 31 deaths in the 60 cases reported.

Measles.—In Mattapoisett an outbreak of 35 cases of measles occurred among school children, as a result of a child sick with the measles riding to and from school in the same bus as other children before the case was recognized.

Typhoid Fever.—An epidemic of typhoid fever that started in September at the Tewksbury State Infirmary, during which month 22 cases were reported, continued for the first few days of October, 38 more cases making their appearance. The source of infection was not definitely determined, but was without doubt an undetermined healthy or convalescent carrier in the infirmary itself.

RARE DISEASES.

Anterior Poliomyelitis was reported from Abington 1, Chelsea 1, Danvers 1, Fall River 1, Haverhill 1, Hopedale 1, Lowell 1, Springfield 2, Stoneham 1 and Wellesley 1.

Anthrax was reported from Camp Devens 1, Lynn 2, Winchester 1 and Woburn 4.

Cerebrospinal Meningitis was reported from Camp Devens 1, Boston 4, Cambridge 1, Chelsea 1, Fall River 1, Holyoke 1, Malden 1 and Worcester 1.

Dog bite was reported from Auburn 1, Boston 2, Brockton 1, Holliston 2, Lawrence 1, Lowell 1, and Newburyport 1.

Dysentery was reported from Dartmouth 3, Greenfield 1, Lawrence 3, Medfield 3, New Bedford 1, and Salem 1.

Malaria was reported from Boston 3, Chelsea 1, Douglas 1, Marblehead 1, and Pittsfield 1.

Pellagra was reported from Boston 1, Lowell 1, Tewksbury 1, and Worcester 1.

Septic Sore Throat was reported from Amherst 1, Boston 1, Gloucester 1, Lexington 4 and Medford 1.

Tetanus was reported from Pittsfield 1.

Trachoma was reported from Boston 5, Cambridge 1, Fitchburg 1, and Worcester 1.

* * *

ANTHRAX IN MASSACHUSETTS FOR THE CURRENT YEAR.

Anthrax is becoming increasingly prevalent since the beginning of the present war, as will be seen by the following table:

1908	5 cases	1913	8 cases
1909	7 “	1914	8 “
1910	7 “	1915	11 “
1911	6 “	1916	31 “
1912	11 “	*1917	39 “

* Nine months.

This marked increase the past two years is a result of the difficulty in obtaining sufficient hides through the normal trade channels by the manufacturer to supply the increased demand.

As a result, hides are now secured from new areas in foreign lands, concerning which the knowledge of prevalence of diseases is meager.

For the first nine months of the present year 39 cases of anthrax have been reported, of which number 6 were fatal. There were 38 cases of external anthrax and one of pulmonary anthrax, this latter being a worker in a hide warehouse. Of the 39 cases, 35 received infection from hides, three from hair and one from wool.

Recently it has been reported by English investigators* that cases of anthrax have been found that had symptoms simulating cerebrospinal meningitis, anthrax not being diagnosed until lumbar puncture had been carried out and the bacillus anthracis demonstrated in the spinal fluid. Thus it would seem advisable to have spinal fluid examination for cases of cerebrospinal meningitis among leather workers.

Anthrax is one of the diseases where the accuracy of the diagnosis is questionable unless the bacillus anthracis is found, and bacteriological smears from the lesion have been urged in all cases of the disease reported, with the foling results:

Total	39 cases
Smears taken in	33 “
Smears negative for bacillus anthracis	8 “
Smears positive for bacillus anthracis	25 “
Diagnosis made at autopsy	1 case
No laboratory examination	5 cases
	39 cases

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* See local government board report by Dr. Francis J. H. Coutts, M.D

Of the 8 cases in which the smear was negative for the bacillus anthracis, 4 were isolated cases, each being the only case in the locality and handling hides which were not connected with other cases of the disease. The 4 remaining cases occurred at the time when other cases among their fellow-workmen, confirmed by smear examination, were reported, and were undoubtedly cases of the disease (Cases 4, 17, 29 and 35).

Of the 6 cases in which no smears were taken, there were several group instances suggesting that the diagnosis was correct. One group of 5 cases was reported, all having handled the same lot of hides (Cases 10, 11, 12, 17 and 29). Cases 10, 11 and 12 had positive smears for anthrax bacilli; Case 17 was negative and no smear was taken for Case 29.

Case 6 was infected at the same time as Case 16. In the latter, the bacillus anthracis was found in a smear.

Cases 20, 22 and 24 were infected at the same time from the same lot of hides. No smears were taken in Cases 20 and 22, but Case 24 was fatal and anthrax bacilli were found in the smear from the lesion.

Thus we have 25 cases confirmed bacteriologically, 7 cases associated with cases confirmed by smear examination, and 1 determined as anthrax at autopsy by pathological examination, making a total of 33 cases, undoubtedly anthrax.

In several instances where the first case reported has been in a stevedore or longshoreman, the factories and health department at the point of destination have been warned of the probable lot of hides infected.

For prevention of infection, the U. S. Bureau of Animal Industry regulations states that hides be immersed for not less than 48 hours in a 1 to 1000 solution of bichloride of mercury, or immersion in a 10% salt solution containing not less than 2% hydrochloric acid, for 48 hours.

For hair disinfection, the U. S. Bureau of Animal Industry regulations state that when hair or wool is suspected to be infected with anthrax, "that all of such wool or hair will be disinfected or sterilized by proper exposure to a temperature of not less than 212° F., for at least 15 minutes prior to any transfer or reshipment."

For hair disinfection, a recent report of the Local Government Board (New Series No. 112) states "that for steam disinfection to be successful, the cases or bales should be opened, the bundles removed and most of the strings cut, unless the temperature inside the steam disinfecting apparatus is maintained at 230° F. for half an hour."

SOCIETY NOTICE.

New England Pediatric Society. A meeting of the New England Pediatric Society will be held at the Boston Medical Library on December 11, 1917, at 8.15 p.m.

I. Report of Treasurer.
II. Report of Council.
III. The following papers will be read:
    The Treatment of Eneuresis with a Report of 26 Consecutive Recoveries.
        W. R. P. Emerson, M.D., Boston.
    The Cause and Treatment of Acidosis in Children.
        W. McK. Marriott, M.D., St. Louis, Mo.
    The Work of the State Committee on Child Conservation..
        Fritz B. Talbot, M.D., Boston.
IV. Election of Officers.

Light refreshments will be served after the meeting.

Maynard Ladd, M.D., *President*,
Richard M. Smith, M.D., *Secretary*.

RECENT DEATHS.

Sir David Caldwell McVail, former professor of clinical medicine at St. Mungo's College, died in Glasgow on November 4, at the age of 72 years. He was well known as an authority on diseases of the respiratory organs and made many contributions to the literature of this subject.

William Gibson Craig, M.D., died at his home in Springfield, November 15, aged 49. He was a graduate of the Jefferson Medical College, Philadelphia, in 1892, and practised ophthalmology and otology. He was a Fellow of the Massachusetts Medical Society and the American Medical Association.

Correspondence.

ANOTHER UNUSUAL CASE.

Reno, Nevada.

Mr. Editor:—

In the January 11 issue of your Journal, on page 75, I notice the report of "An Unusual Case." I recently had one which was almost parallel. The night of January 11, W. M. G., a "broncho buster" came to me for relief of urinary retention. He gave a history of no bowel motion reaching over three days and that he had not been able to urinate between 9 A. M. and 11.30 P. M., when he called on me. On trying to pass a soft catheter I found a very marked spasm of the cut-off muscle, it taking me not less than quarter of an hour to get into the bladder. At this time the urine amounted to almost a quart. At 6.30 the following morning he again came in for relief from retention. I had the same trouble in getting into the bladder. At this time I gave him hyoscyamine to be taken 1/1000 grain every hour. At 5.30 P. M., he reported back that he had been able to empty his bladder voluntarily twice during the day and that peristalsis seemed to be starting up. I then gave him a cathartic pill to be taken at bed time. The next morning he reported that he had had a bowel action shortly after leaving my office the night before and that he had been able to urinate twice.

This man had been bucked off a wild pony a few weeks before coming to see me and the animal had fallen on him. He was knocked out completely and remained so for several hours, but seemed to feel no subsequent ill effects thereafter, other than some general soreness. There arose in my mind that there might be some central nerve injury and that the bladder and bowel conditions were due thereto. However, as the hyoscyamine seemed to relieve the spasm completely, I am rather of the idea that the cause lay elsewhere. I am free to confess that I could find no real cause for the strong and continued spasm. Otherwise the patient was absolutely well in every respect—one of our robust Nevada cowboys.

I am giving you the report of this case as it seems so closely allied to that of Dr. Bowker.

Yours very sincerely,
George L. Servoss, M.D.,
Editor, *Western Medical Times*.

The Boston Medical and Surgical Journal

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Original Articles.

METHODS OF PREPARING AND USING RADIOACTIVE SUBSTANCES IN THE TREATMENT OF MALIGNANT DISEASE, AND OF ESTIMATING SUITABLE DOSAGES.

BY WILLIAM DUANE, PH.D., BOSTON.

[From the Cancer Commission of Harvard University.]

ABOUT four years ago the writer came to Boston, on the invitation of the chairman, and proposed to the Harvard Cancer Commission an investigation of the effects of radium rays on malignant disease, when applied by certain new methods. The Commission decided to take up the work, and we now see at the Huntington Hospital over five hundred new cases of malignant disease a year, almost all of which receive more or less treatment with radioactive substances. In some cases, very satisfactory results have been obtained, giving what may be called apparent cures. In others, marked alleviation has been observed, with prolongation of life and increased comfort; and in other cases still, no benefit, and possibly added discomfort, may have been produced. The fact that the medical profession keeps sending us so many cases for treatment would seem to indicate that we are doing a useful work in the community, and this, together with the character of the results actually obtained warrants the publication of a detailed statement of the methods employed in preparing the radioactive substances, of the methods of measuring the dosage, and of the general principles upon which the character of the treatment is determined.

The following paper contains a description of the scientific principles employed in the preparation of the applicators and of the instruments for measuring their radioactivity, and a brief statement of the kinds of cases in which the various methods are used and the dosages actually employed.

In order to make clear the principles underlying these investigations, it will not be out of place to state a few of the well-known facts and laws that have been discovered in the branch of science called "Radioactivity."

Radium is a chemical element belonging to the group of metals, but unlike most other elements, it is not extraordinarily stable. It transforms itself at a measurable rate into another substance called radium emanation. The rate of transformation, however, is so slow that about 1700 years would be required for half a given quantity of radium to disappear.

The emanation is a chemically inert gas, and it, too, transforms itself into a third substance called Radium A, but this is not all. Radium A transforms itself into Radium B, and Radium B into Radium C, etc., thus forming a series of substances related to each other as father to son. The last of the line known to exist is Radium F, also called polonium; which, as a matter of fact, was the first radioactive substance discovered by the Curies. Considerable evidence also has been collected of late years in favor of the supposition that polonium transforms itself into lead.

None of the above substances are gases except the emanation. Radium A, B, and C deposit themselves on anything and everything that comes in contact with the emanation, including the walls of the vessel that contain it. For this reason, Radium A, B, C, etc., frequently are grouped together under one name, and called collectively "deposited activity." These substances transform themselves much more rapidly than their grandparent, radium itself, does. Half a given quantity of emanation disappears in three and eighty-five-hundredths days; half a given quantity of Radium A, in three minutes; of Radium B, in twenty-six and eight-tenths minutes; of Radium C, nineteen and five-tenths minutes, etc. Thus the emanation lasts longer than the deposited activity; the former's life being measured in days, and the latter's in minutes. These substances differ from each other very much in their physical and chemical properties, but they have one characteristic in common,—they are radioactive.

By radioactive substance, we mean a substance that continuously emits peculiar types of invisible rays that differ substantially from light and heat rays. The radiation from radioactive substances, if sufficiently intense, destroys tissues, and this fact forms the basis of the therapeutic applications of the radioactive substances. In such applications, one or more of the radioactive substances, in a special container, is placed in or near the malignant growth to be treated, or is injected into the growth in the form of a solution, and the rays from the substance, passing through the tumor cells, destroy them.

Among the above-mentioned substances, Radium C produces by far the most penetrating rays. Radium B also emits some penetrating rays; but neither radium nor the emanation produces rays that are capable of passing through the walls of the glass tubes in which they are usually kept. "Why, then," it may be asked, "are tubes containing radium used for therapeutic treatment?" The answer is that they are not so used until the radium has been in them long enough for the Radium B and C to accumulate. When this has occurred, the only function fulfilled by the radium is to supply Radium B and C as fast as they destroy themselves, the latter being the real source of the penetrating radiation.

It follows, therefore, that, if by suitable means we deposit Radium B and C on an applicator or in a tube, we can use the applicator or tube to radiate tissues, just as if it contained radium itself, and this is the fundamental principle of the methods about to be described.

The deposit of Radium B and C can be obtained in a variety of ways, of which the following may be mentioned:

(1) The emanation may be extracted from the radium and pressed into a glass or metal container of any desired shape and size, and the Radium ABC allowed to accumulate in it. The container is then ready for use, either with or without the emanation, according to the length of time required for the treatment. The emanation, if left in the container, simply prolongs the time during which the activity lasts, by keeping up a supply of the Radium BC. The emanation itself does not add to the penetrating radiation.

(2) Radium ABC may be deposited on sheets of metal or other substances by leaving them for several hours in contact with the emanation contained in the closed chamber. The sheets are then attached to the tissues, to be radiated by adhesive plaster or otherwise.

(3) Radium ABC may be dissolved in water or other liquid, either by dissolving the purified emanation and allowing it to transform itself into Radium ABC, or by depositing the Radium ABC on grains of salt (or other substances) and then dissolving the salt in the liquid. In this way, a large amount of activity can be put into a few drops of liquid. The liquid is then injected in the tissues or blood-stream.

In order that these methods shall be of practical value, it is necessary to have an efficient machine for collecting and purifying the emanation. Such a machine was designed several years ago by the writer.

The general principles of the method are those previously employed by Ramsay and Soddy, Rutherford, and Debierne, in some of their most important researches. The advantages of the method described below are: that the purification does not require liquid air; that a large number of millicuries of emanation can be purified and compressed into a small fraction of a cubic millimeter, in ten or fifteen minutes of time; that no emanation is lost except that due to its natural decay; and that the process may be repeated a great many times without renewing parts of the apparatus.

Fig. 1 represents the arrangement of the glass tubes and reservoirs. The bulb A contains the radium salt dissolved in water. Radium in solution continually decomposes the water into hydrogen and oxygen, and at the same time transforms itself into the emanation, which is set free. The total volume of the hydrogen and oxygen amounts to more than two hundred thousand times that of the emanation at the same pressure and temperature. In addition to the oxygen and hydrogen and emanation, a small quantity of helium appears (the volume of which is a few per cent. greater than that of the emanation) and also traces of other gases, probably carbon dioxide and hydrocarbons coming from the decomposition of organic impurities, although the source of these traces of gas does not seem to be thoroughly understood. On account of its radioactive transformation, the exact proportion between the quantity of emanation and the gases with which it is mixed, depends upon the length of time the gases are allowed to accumulate. In the ordinary daily routine of our laboratory, however, the problem resolves itself into the extraction of 140 to 240 millicuries of emanation having a volume of 0.084-0.144 mm.[3] at atmospheric pressure and ordinary temperature, from a mixture of gases, having a volume of 18 to 36 cc. at the same temperature and pressure.

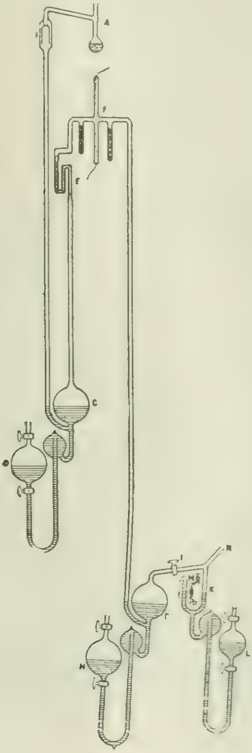

Fig. 1.

The mixture of gases collects in A and the tube B, and also, if the passage is open, in the reservoir C. Allowing the gases to collect in C apparently increases the efficiency, probably because the emanation diffuses from the solution into a large volume more freely than into a small one. The tube B is considerably longer than 76 cm. so that air may be admitted into C, if desired, without its finding its way up into the radium solution. The trap at B protects against mercury spurting up into the radium solution, should some of the glass apparatus break. An ordinary water aspirator with suitable stopcocks controls the flow of mercury between the reservoirs C and D. On admitting the air into D, the mercury rises in C, pushing the mixture of gases through the mercury trap E, into the tubes F. The mercury in the trap E holds back all but a very small quantity of the water vapor. The tubes F contain a copper wire, slightly oxidized, phosphorpentoxide and potassium hydroxide. Although represented in the figure in a vertical position, the copper wire really lies horizontal. It is wound on a quartz rod supported by quartz feet, so that the wire does not touch the inner surface of the tube at any point. The diameter of the wire is 0.3 mm. and the length of the coil 25 cm. When heated red hot by an electric current of 5-10 amperes, it rapidly combines the oxygen and hydrogen, the phosphorpentoxide absorbing the water vapor formed. A small amount of copper oxide on the wire is required, because the mixture of gases contains (at least at first) a quantity of hydrogen that exceeds by a few per cent. the proportion required by the chemical formula for water. Some oxygen remains in the radium solution as hydrogen peroxide. The copper wire was heated for a long time to remove as much of the occluded gases as possible, and the phosphorpentoxide was distilled into its present position from a tube sealed on just below it, and afterwards removed, both of these processes taking place in vacuum. The potassium hydroxide is for the purpose of absorbing any carbon dioxide that may be present, or may be formed by the hot copper wire oxidizing hydrocarbon gases.

After the purification of the emanation the mercury in the reservoir G is drawn into H, the air being removed from H by the water aspirator, and the emanation and helium pass into G. The gases are then pushed up by the mercury through the stopcock I and into the desired tube or container, which is sealed on at N. The volume of the helium being very small, for the vast majority of purposes it is unnecessary to remove it. The length of the tube connecting E with G should be so great that air may be admitted into G without forcing the mercury up into F.

The stopcock I has a mercury seal, and contains no stopcock grease. A few marks made with a lead pencil on the stopper allow it to turn freely. It will be noticed that the emanation passes through no stopcock except the one at I, and even this is unnecessary, and has been added for convenience of manipulation only. The fact that stopcock grease and many other organic substances are decomposed by the rays from the emanation and give off gases is well known.

The system of tubes and bulbs K, L, M is for the purpose of removing the air from the other tubes and reservoirs, etc., by means of a pump attached at M. This must be done at the beginning, and after that no air enters the reservoirs except occasionally when it becomes necessary to renew the oxidized wire or the phosphorpentoxide, etc.

The apparatus in our laboratory has been in continuous use for more than four years. The bulb A now contains over nine hundred twenty milligrams of radium (element), and the total quantity of emanation purified per month amounts to more than 4.5 curies of emanation. A curie is the quantity of emanation in equilibrium with one gram of radium (element).

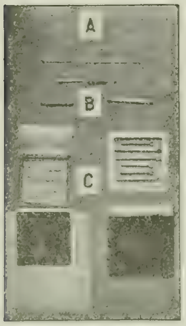

Fig. 2.

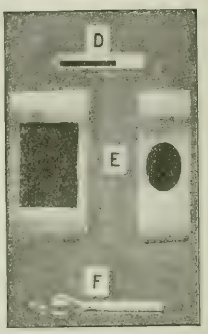

Fig. 3.

One of the most important advantages in using the emanation instead of the radium salt itself for treating cancer, is that the emanation can be put into tubes that are very much smaller than the tubes would have to be to contain an equivalent amount of radium, and also because a much greater variety in the size and shape of the applicators can be obtained.

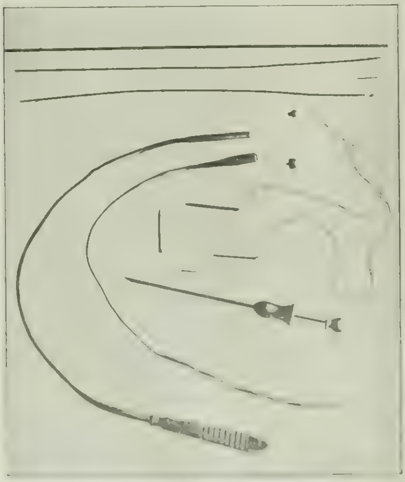

Fig. 4.

Figs. 2, 3, 4, and 5 represent some of the tubes and applicators in use in the Huntington Hospital. The small glass tubes at A in Fig. 2 contain radium emanation. They were originally joined at N to the emanation apparatus represented in Fig. 1, and were sealed from it by means of a very small gas flame, after the emanation had been pushed into them by a column of mercury.

Usually these glass tubes are placed in steel tubes shown just below them in Fig. 2. The steel tubes have an eye that screws into one end, and a more or less sharp point that screws into the other end. The eyes are for threads, which are usually colored, and a record is kept of the amount of emanation in the tube. It often happens that for treating a particular case, it is desirable to cut off the easily absorbed rays, and this is done by surrounding the steel tubes by larger tubes (represented in Fig. 2), a millimeter or two thick, of silver or lead or platinum, according to the amount of filtration desired.

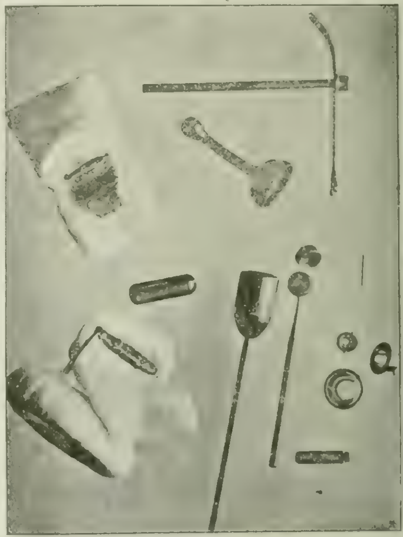

Fig. 5.

Sometimes it is desired to cover a large area of the skin with a lot of tubes of small strength. The metal frames in boxes represented at C in Fig. 2, are convenient for this purpose, and may contain either the glass tubes or the glass tubes inside the steel tubes; they are fastened by means of adhesive plaster as represented.

E (Fig. 3) represents the applicators on which the deposited activity has been placed. There is no emanation in them. In order to make these applicators a sheet of metal is wrapped on the inside of a glass tube, as at D, and this glass tube is sealed on to the apparatus of Fig. 1 at N. The emanation is then pushed up over the mercury until it occupies the space inside of the metal sheet at D, and is left there for several hours for the deposited activity, Radium ABC, to accumulate. At the end of about three hours, the maximum amount has accumulated. The emanation is then withdrawn through the stopcock I in Fig. 1, into the globe G in order to save it, and after closing the stopcock the tube is cut off and the metal sheet spread out on adhesive plaster as at E in Fig. 3. The applicator is then applied over the area as desired. This method of treating cases is useful in very superficial lesions covering large areas, in which it is desired to get a uniform radiation over the whole surface. It has the advantage that a uniform, and, if desired, very small filtration can be obtained.

F in Fig. 2 represents a bulb used in preparing intensely radioactive solutions. A few grains of ordinary salt are placed in the small bulb at the extreme left end of the tube; the tube is then sealed to the emanation apparatus at N and the purified emanation, pushed up in between the grains of salt, and left there for three hours. The deposited activity, Radium ABC, accumulates on the grains of salt. At the end of three hours or so, the emanation is removed and put into the globe G; the glass bulb is cut off from the emanation machine, and distilled water squirted into the small bulb containing the activated salt. The salt dissolves in the water, carrying with it into solution most of the deposited activity, Radium ABC. If care is taken to use the proper amounts of salt and distilled water, a physiological salt solution can thus be obtained, containing a very large quantity of deposited activity per cubic centimeter.

Solutions of this kind have been used in the Huntington Hospital for injections into the blood-stream and into tumor tissues.

Fig. 4 represents tubes that have been used in cases in which it was desired to insert the active substance into the tumor itself. This may be done in several ways; either the glass tubes may be put into the tumor through a trochar and left there, or they may be placed inside of metal tubes such as represented in the figure, made long or short, thick or thin, and then withdrawn after the desired period of time has elapsed. If the glass tubes are put into the tumor through a trochar and left there a very prolonged radiation ensues. The emanation disappears, little by little, half of it decaying in slightly less than four days, half of what is left in four more days, etc., so that the tissues are radiated for several weeks continuously, though with progressively decreasing intensity. In certain types of tumors this is by far the most effective method of using radium that I have tried.

Long metal tubes, such as those represented at the right side of Fig. 4, have been used for inserting the radioactive substance into tumors that lie some distance below the skin. A little glass tube containing the emanation lies in the end of the metal tube, close to the sharp point. The two curved instruments in Fig. 4 are of silver and have been used in cases where some filtration was desired. In the thicker one, the hole containing the glass tube has been bored eccentrically, thus giving a much greater filtration on one side than on the other.

Fig. 5 represents the tubes and applicators that are used for intra-uterine conditions, and in cancer of the cervix. The figure also shows the applicators employed in cases where it is desired to hold the radioactive substance at some distance from the skin, as in leukemia and malignant lymphomata.

The small metal cones are used with the steel tubes, to raise them above the surface of the skin, and thus produce uniform radiation over certain areas. These cones hold the steel tubes at distances of 1 cm. to 2 cm. from the surface of the skin. There are various sizes to correspond to the areas of superficial lesions.

The large lead applicator on the brass support is used to give a "distance filtration," of six centimeters or so.

The gauze wrapped around some of the lead applicators serves two purposes: firstly, it cuts off the secondary radiation coming from the surface of the lead, which is not very penetrating, and would produce considerable irritation in the skin; and, secondly, it raises the applicator up from the surface of the skin, thus, according to the inverse square law, reducing the amount of radiation absorbed in the skin as compared with the amount absorbed at a considerable distance below the surface.

It is of the greatest importance in treating malignant disease to be able to vary the penetration of the rays at will, and at the same time to know accurately how penetrating the rays are. The applicators described above provide a very flexible technic with penetration of rays varying within wide limits.

The absorption of rays from radioactive substances by tissues appears to be a very complex phenomenon, and a special article on this subject is in preparation.

Whenever Nature acts, she acts quantitatively as well as qualitatively. Physics deals almost exclusively with quantitative measurements. The importance of estimating phenomena quantitatively, of making exact dosages, is nowhere greater than in the application of the radioactive substances in the treatment of cancer. One must send through the tissues, not simply radiation, but enough radiation to destroy the tumor, and one must be sure to use radiation sufficiently penetrating to reach all the diseased tissues.

The first step in a quantitative estimate of dosage is to measure the quantity of radium, of emanation, or deposited activity, as the case may be, that the applicator contains.

The following paragraphs will be devoted to a description of our measuring instruments. There are three of them:

(*a*) An instrument for accurately measuring the quantity of the radioactive substance in the

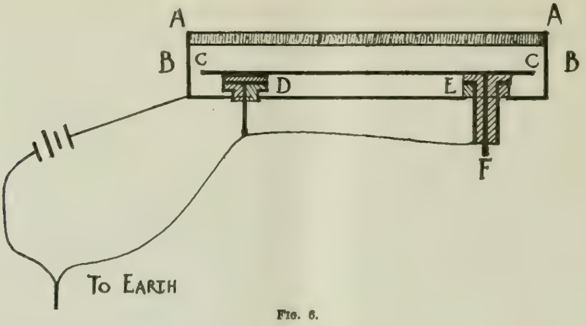

Fig. 6.

applicator, or in a piece of tissue, as the case may be. This instrument is in our laboratory in a room at a considerable distance from the emanation apparatus. The emanation gradually diffuses through the halls and rooms, and leaves behind it on the walls, floor, furniture, etc., the deposited activity, which in time will make delicate and accurate measurements of radioactivity impossible in the part of the building near the emanation apparatus.

(*b*) An instrument for roughly and rapidly estimating the quantity of radioactive substances in tubes and applicators. This instrument is in the hospital in the room in which most of the radium treatments are given, and is used frequently to make sure that the tubes and applicators are in order.

(*c*) An instrument for detecting the presence of radioactive substances. This instrument is a simple form of electroscope, and is used for finding lost tubes that have been thrown away with the bandages, etc., and for ascertaining whether or not the small glass tube previously inserted into the tumor is still intact, and has not been broken.

Fig. 6 represents the apparatus used for accurately measuring the quantity of the radioactive substance in the applicator or tissue. AA is a sheet of lead 50 cm. in diameter and 1.5 cm. thick. It rests on top of a circular brass box, BB, the same diameter as AA, and about 3 cm. deep. A horizontal brass disk, CC, lies in the center of this box, and is insulated from it by hard rubber supports, DE. The box B is charged by joining it to one pole of a battery having an electromotive force of 100 volts or so, and in order to prevent the current from passing from the box B to the disk C through or along the surface of the supports DE, the supports are supplied with metal disks and rods joined to earth as represented. Thus any current starting from the box B along the surface of D would meet this conductor, and pass off to earth without reaching CC.

In order to measure the quantity of a radioactive substance in an applicator, the applicator is placed on top of the lead disk AA. The penetrating gamma rays from this substance then pass through the disk and into the box, where they make the air in the box a conductor of electricity. Under ordinary conditions, air is not a conductor of electricity, but the radium rays have the power of making the air a conductor of electricity, and this phenomenon is called the ionization of the air. When the air is ionized, the current passes across from the box B to the disk C. The greater the amount of the active substance on top of the lead AA, the greater will be the amount of radiation passing through the air in the box, and the greater will be the current flowing from the box to C. This current, under proper conditions, is proportional to the quantity of the radioactive substance on the lead, and is universally regarded as the most satisfactory measure of that quantity.

In order to measure the current flowing from the box to C, one of the supports, E, is perforated, and a wire, F, passes through it and is connected to an instrument for measuring currents of electricity.

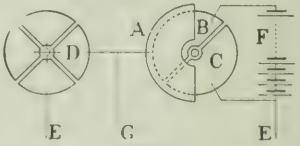

Fig. 7.

The most satisfactory method we have found for measuring the current is to use a variable electrical condenser and quadrant electrometer. A very convenient variable condenser for the purpose has been designed by Dr. Harry Clark, who has charge of the laboratory experiments in our course in Radioactivity.[*] Fig. 7 represents the apparatus. A pile of fixed plates, A, insulated from the rest of the apparatus, is joined to one quadrant D of an electrometer, and also to the wire F in Fig. 6, through which the current from CC comes. Two movable piles of semi-circular plates, B and C, insulated from each other, are mounted on the same support in such a way that they rotate about the axis, and slide in between plates A without touching

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[*] Physical Review, July, 1915, pp. 43-45.

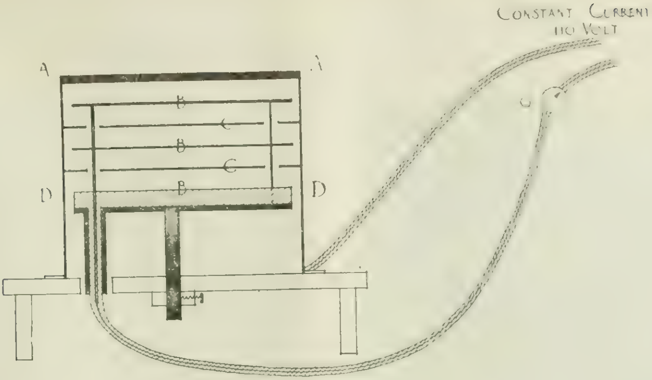


FIG. 8.

them. One set of plates, B, is joined to a battery of constant electromotive force, while the other set is put to earth. Under these circumstances, a rotation of B and C in one direction or the other will cause a charge of electricity to be induced on the plates A; if B and C are rotated at just the right rate, this charge will exactly neutralize the current coming to G from the box of Fig. 6. The rate at which B and C must be turned in order that this neutralization shall take place can be determined by observing the quadrant electrometer D. The plates must be turned just fast enough to keep the electrometer needle at rest. Under these conditions, if the plates at B and C are always turned through the same angle (and stops in the instrument are so placed that this is the case), then the current is inversely proportional to the time required to turn the plates through the angle, and this time is therefore the measure of the current coming from the ionization chamber. In this method, the quadrant electrometer acts simply as an instrument for detecting small charges of electricity.

In order to measure quantities of the radioactive substances in terms of standard units, the apparatus must be standardized. This is done by placing on the lead plate AA of Fig. 6 a sealed glass tube containing a known quantity of radium, and by measuring the ionization current that this produces.

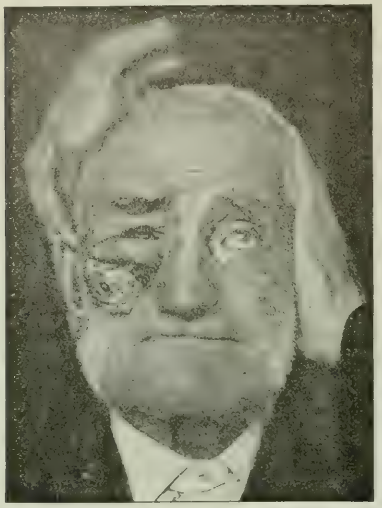
The unit in which quantities of emanation are expressed has by international agreement been defined to be the quantity of emanation that is in equilibrium with one gram of radium element. For practical purposes, this quantity of emanation in a small sealed tube would produce the same penetrating radiation as a gram of radium, for it would have associated with it practically the same quantity of Radium B and C. Consequently, the number of millicuries of emanation in the container, divided by the number of milligrams of radium in the standard, is equal to the ratio of the measured currents when the emanation tube and the radium tube are placed on the lead disk AA, respectively, and these currents are inversely proportional to the two measured times. Hence, practically all that is necessary to do in measuring the quantity of emanation is to divide a certain constant by the measured time.

Fig. 8 represents the instrument in the hospital, used for roughly estimating the strength of the tubes and applicators. AA is a lead disk 30 cms. in diameter and 1 cm. thick, upon which the tube or applicator is placed. BB, etc., are thin sheets of aluminum, supported by metal rods and joined through an insulated copper wire to the galvanometer G. CC are plates parallel to BB, but fastened to the metal box DD, which in turn is joined by an insulated wire to one pole of a battery, or one terminal of an electric light circuit furnishing constant current at 110 volts, the other terminal being joined to the galvanometer as represented.

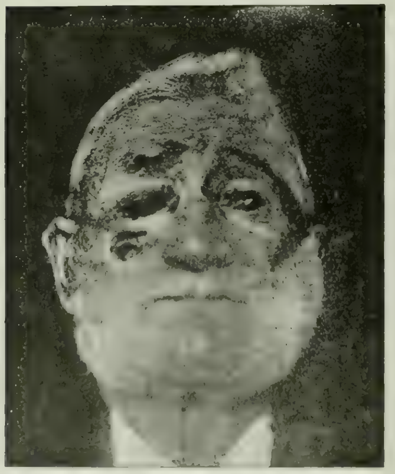
When the applicator containing the radioactive substance is placed on AA, the penetrating rays from it pass through the lead disk AA into the box DD, where they ionize the air. The current then passes from the box through the plates CC, across the air space to the plates BB, and then through the supports and wire circuit to the galvanometer, and thence back to the source of current. The galvanometer deflection is most conveniently read by means of a mirror, lamp and transparent scale. The deflection of the spot of light on the scale measures the current and thus the quantity of activity in the applicator, provided that the deflection of the galvanometer produced by a known quantity of radium has first been obtained.

This instrument is not quite as accurate as the one described above, but is much more convenient and the measurement can be made much more rapidly, for all that is necessary to observe is simply the deflection of the spot of light on the scale.

In order to illustrate the effects produced by the rays on cancer tissue, and, especially, to give an idea of the quantity of the radioactive substance, the time and the filtration required to produce given effects with the above-described methods of treatment, the following cases are cited, chosen from the records of the Huntington Hospital. The history and diagnosis of the disease, and the clinical findings, will be discussed in other sections of the report, by various members of the hospital staff.



Case 1. a.—June 7, 1915.



Case 1. b.—Jan. 12, 1916.

The following cases represent treatments of epidermoid carcinoma. This group of cases is by far the largest of any that we have treated. In selecting illustrations, the most extensive lesions that we have been able to influence favorably have been chosen, so that an idea may be obtained as to the limits of what can be done with the amount of radium at our disposal, namely, 230 milligrams of the element. (Since the period covered by this report, our supply of radium has been increased to about 1 gram.)

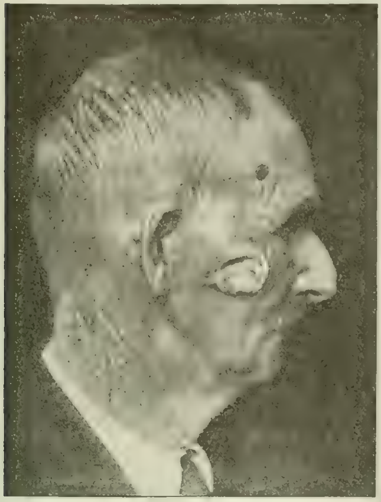
Case 1 represents a recurrence after operation. The pathological diagnosis was epidermoid carcinoma. The treatment given consisted almost entirely of the insertion of small glass tubes containing a few (from 1 to 9) millicuries of radium emanation. The glass tubes remained in place for ten days or two weeks at a time. The treatment began on May 27, 1915, and lasted for nearly a year, at greater or less intervals of time. A practically continuous stream of radiation passed through the tumor for the first six weeks. Two recurrences took place. The figures illustrate the condition of the lesion near the beginning of treatment, on June 7, 1915, and on Jan. 12, 1916. The second recurrence took place after this date, the disease having progressed through into the mucous membrane of the right cheek.

Case 2 represents a condition the pathological diagnosis of which was also epidermoid carcinoma. This lesion was treated almost entirely by the insertion of glass tubes through a trochar into the tissues, giving a prolonged treatment. Treatment began on October 14, 1915, and lasted until May 26, 1916, at intervals varying from one week to two months. The glass tubes contained amounts of emanation varying from 2 to 10 millicuries, and the tubes remained in place on an average of about two weeks. During the latter part of the treatment, the tumor tissue had practically disappeared, and during this period a few treatments were given with steel tubes, each containing from 15 to 34 millicuries, the treatment lasting from one-half to one and one-half hours. The photographs represent the condition of the lesions before and after treatment.

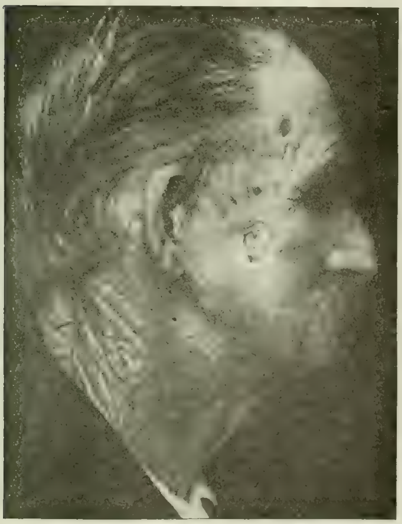
Two fragments were removed from the scar on July 14, 1916, for pathological examination, and Dr. Tyzzer reported that one fragment consisted of necrotic tissue and hyalinized blood clot. The other fragment consisted of an abnormal connective tissue, covered with thick squamous epithelium. Pathological diagnosis: no evidence of new growth.

The condition of these lesions had not perceptibly changed when the patient died of pneumonia on January 24, 1917.

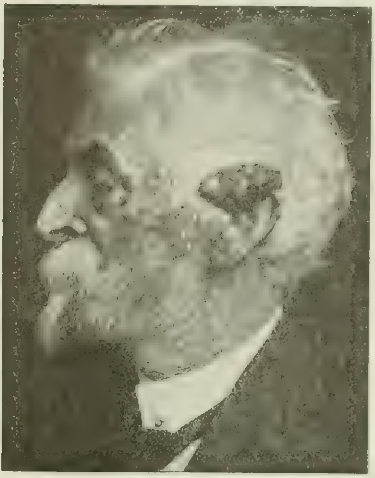
Case 3 represents a series of keratoses widely distributed, some of which, according to pathological report, had definitely degenerated into epidermoid carcinomata. The large tumor growing on the left ear was treated by the prolonged radiation method, the small glass tubes containing a few millicuries of emanation being left in the tissue for two to three weeks. The other lesions were treated by means of the steel tubes with filtration of a few millimeters of air and cotton. The usual length of the steel tube treatment was from one-half to one and one-half hours, and the amount of emanation in the tubes varied from 14 to 47 millicuries. Treatment began on July 7, 1915, and lasted, at intervals of from one week to two months, until January 2, 1916.



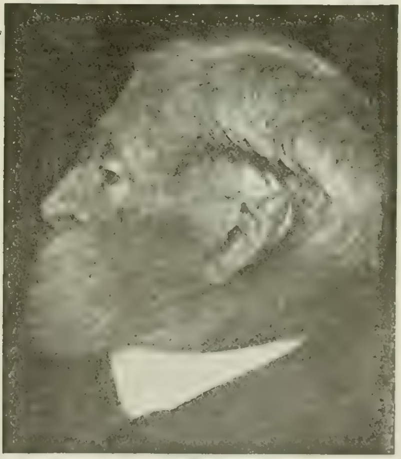
Case 2. *a.*—Oct. 27, 1915.



Case 2. *b.*—July 21, 1916.

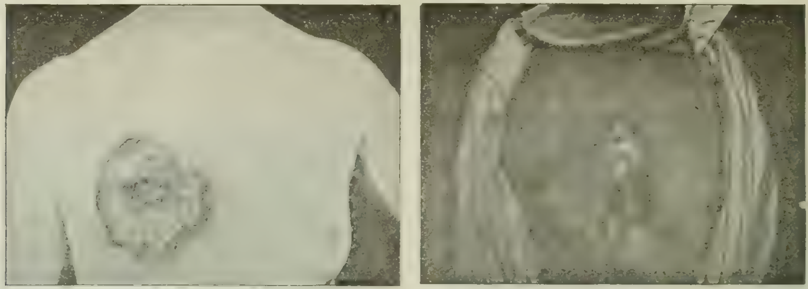


Case 3. *a.*—July 7, 1915.



Case 3 *b.*—Nov. 17, 1916.

The photographs represent the condition of the lesions on the left hand side of the face before and after treatment. The last treatment of the tumor on the left ear was given on August 24, 1915. During the interval from July 7 to August 24, eight glass tubes, containing a total of 50 6-10 millicuries of emanation were inserted into this tumor, and left in place. Four steel tubes were also used during this period, each for about one hour, containing from 15 to



Jan. 30, 1914. Sept. 28, 1917.

Case 4.—Pathological Diagnosis: Scirrhus Carcinoma.

35 millicuries of emanation. On July 14, 1916, a specimen was removed from the scar on this ear, for pathological diagnosis. Dr. Tyzzer reported that the specimen consisted of cartilage, in part necrotic, against which lay a layer of fibrino-purulent exudate. Superimposed was a layer of dense, degenerative connective tissue, and at the surface, fibrino-purulent exudate. Pathological diagnosis: no evidence of tumor.

The condition of the lesions in March, 1917, when the patient was last seen at the hospital, did not differ perceptibly from that represented in the photograph of November 27, 1916.

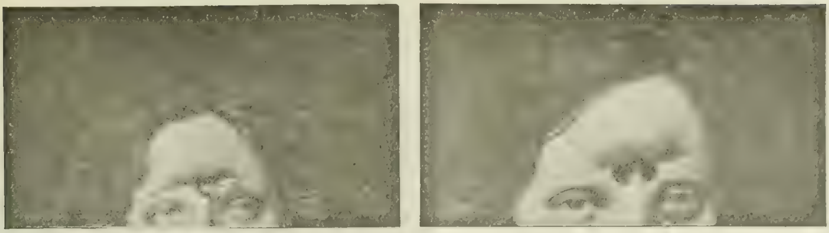
The three cases cited above illustrate what may be termed the prolonged radiation treatment. There are, in general, three important factors entering in a quantitative way into the effects produced by the radiation: (*a*) the amount and distribution of the radioactive substance used, (*b*) the time of exposure to the rays, and (*c*) the filtration. The question as to the effects produced by a small quantity used for a long time, as opposed to a large quantity used for a short time, has not been definitely decided for all cases. In the above treatments, the time element was very large, for the tumors were subjected to continuous radiation for six weeks or two month at a time, the intensity of the radiation being correspondingly small. Thus the time element was enormously increased at the expense of the intensity element. The method has another great advantage also, in that the most energetic of the radioactive rays are used to their fullest extent. The walls of the glass tube being very thin, they absorb very little radiation, which means that a very large percentage of the radiant energy is absorbed in the tissues within a few millimeters of the tube. The distance to which the radiation extends depends to a considerable extent upon the thickness of the glass. In general, the tubes are such that the destructive action on normal tissues caused by the rays, extends to a distance of 7 or 8 millimeters. Under these conditions, epidermoid carcinoma tissue will be destroyed at a considerably greater distance. If it is desired to extend still further the limits of the destructive action, larger doses must be used.

In spite of the fact that the radiation of the tumor lasted continuously for six or eight weeks, no destructive effect was produced on neighboring healthy tissue. A slight erythema, however, appeared for a distance of 2 cms. or so around the lesions.

Cases 2 and 3 above represent the most extensive epidermoid carcinomata that we have been able to destroy so completely that the presence of the carcinoma tissue could not be demonstrated. We have treated a large number of similar cases, and cases of less extensive lesions, which it is unnecessary to describe in detail.

The method of inserting glass tubes through a trochar can be applied only to cases in which the lesion occupies a certain volume. Conditions in which the epidermoid carcinoma tissue is distributed in a more or less thin layer, over a large or small area, must be treated in other ways.

Case 4 represents one of the most extensive lesions of superficial carcinoma that we have treated at the hospital. It illustrates the limit of what we have been able to do with the radium at our disposal. A large number of smaller lesions have been completely removed by the radium treatment. This case demonstrates the effects that can be obtained by a very large number of separate treatments, extending over long periods of time. Radium applications began on February 2, 1914, and the patient is still under treatment. The disease has never disappeared entirely, but the treatment has kept it under control, so that the carcinoma tissue has not extended superficially, and no physical evidence exists that internal metastasis has occurred. During the three years and more that have elapsed since the beginning, the patient has received 64 treatments, with quantities of emanation ranging from a few millicuries up to 142 millicuries. The length of each treatment varied from 1 to 3 hours, and the filtration varied from that due to the glass walls of the emanation tubes themselves, to two millimeters of lead, depending upon the area and thickness of the por-



Nov. 2, 1913. May 28, 1914.

Case 5.—Pathological Diagnosis: Sarcoma.

tions of the tissue to be treated. There has been a marked general improvement in the condition of this lesion, an improvement that has been maintained.

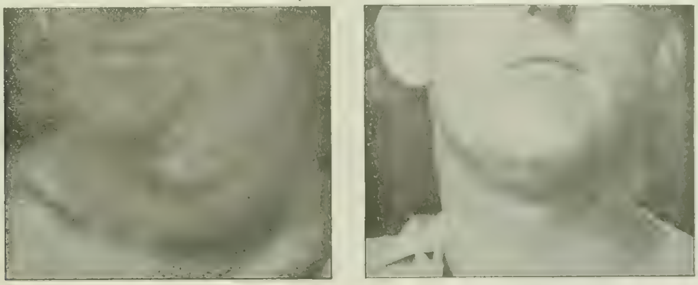
The following sarcoma case illustrates the effects that can be obtained by inserting metal tubes containing radium emanation into the center of the tumor tissue itself. It was one of the earliest cases treated at the hospital, and the satisfactory results obtained are largely due to Dr. Ordway's skill in making the applications. The patient has remained free from signs of recurrence to the present date.

The record contains a number of pathological reports, which give sarcoma with numerous mitotic figures as the diagnosis. The radium applications began on November 28, 1913, and lasted until August 6, 1914. During this period 22 radium treatments were given, the maximum dose recorded being 59 millicuries. The treatments consisted of two kinds: in one the metal tubes were inserted with very small filtration into the tumor tissue itself; in the other, the tubes were laid on the surface, with filtration varying in amount from a fraction of a millimeter of steel, to one millimeter of lead. The length of time varied from one to twenty-four hours. It is probable that the favorable results obtained in this case are due to prolonged treatments, in which the tubes were inserted into the tumor itself.

It is a well-known fact that the large masses of tissue that occur in malignant lymphomata (Hodgkin's disease, lymphosarcoma, etc.) are peculiarly susceptible to radiation. These masses disappear under the action of the rays, but they are very apt to recur; if not in the same place, at other points in the body, and the radiation of one mass has no destructive effect upon masses at a distance. The following case is cited as illustrating the destructive effect that can be produced on this type of tissue by prolonged exposure to the rays from a relatively small amount of radium.

Case 6 represents, perhaps, the largest masses of tissue that we have been able to cause to disappear. The tumor has been subjected to radiation a large number of times between January, 1916, and April, 1917. The doses varied from 31 to 550 millicuries, and the time of exposure from 8 to 48 hours. The total number of millicurie hours during the entire treatment amounted to 93,756. This case is still under treatment.

The method of treating these cases differs fundamentally from that employed in those previously mentioned. Only the penetrating gamma radiation is allowed to pass through the tissues, the filtration being two millimeters of lead, and about two to three cms. of gauze; sometimes, also, the applicator is held on a brass frame at a distance of 6 or 7 cms. from the skin, in order to reduce the skin effect in proportion to the radiation of the underlying tissues. The gamma radiation that goes through this amount of matter carries with it an exceed-



Jan. 9, 1916. April 1, 1917.

Case 6.—Pathological Diagnosis: Malignant Lymphoma (Hodgkin's Disease).

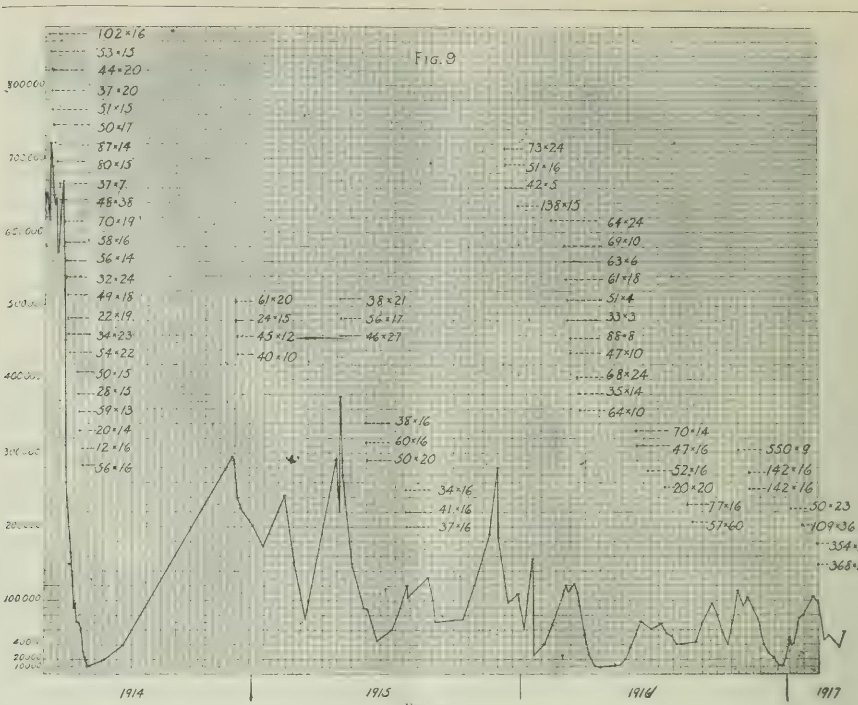
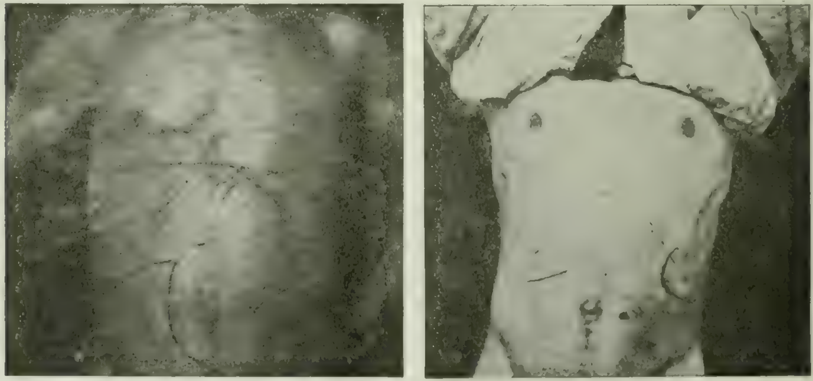


Fig. 9.

ingly small quantity of energy, and it is one of the most extraordinary facts connected with these mysterious substances that such a small quantity of energy can have any appreciable effect on such large masses of living tissues.

As is well known, x-rays produce marked alleviation in cases of myelogenous leukemia, and the fact that radium also has much the same effect was observed in Paris years ago. The best method of treating leukemia with radium is substantially that described above in the case of malignant lymphomata. The emanation tubes, in a lead box with walls about two millimeters thick, are placed at different positions over the spleen, and left there from four to six hours, when they are changed to other positions. The chart in Fig. 9 represents the effect of the radiation on the white cell count of the blood, the



June 4, 1914.

March 20, 1914

Case 7.—Pathological Diagnosis: Myelogenous Leukemia.

figures giving the dosage. The first figure represents the number of millicuries, and the second the number of hours of treatment, respectively. It will be noticed that every series of treatments is followed by a diminution in the white count, even though this is given after a large number of recurrences.

The fact that there is a general decline in the magnitude of the recurrences during the three years in which the patient received treatment is the most hopeful characteristic to be noticed. Attention is called to the fact, however, that larger doses have been used the last few months than before. This chart refers to Case 7, and photographs representing it are also given. These photographs show the diminution produced in the size of the spleen during the first part of the radiation. The spleen has remained small ever since.

Here, again, the size of the effect produced by a small amount of radiated energy is noteworthy. It would take rather delicate chemical tests to discover the chemical change produced by this radiation in so large a quantity of matter.

An exceedingly interesting study of a large number of cases of leukemia treated with radium will be published by Dr. Peabody in a special article on the subject.

ORTHOARTERIOTONY (A NEW FORM OF PHARMACODYNAMIC ENERGY): THE BIOCHEMIC EXPLANATION OF ITS ACTION, TOGETHER WITH A CONTRIBUTION TO THE INTERPRETATION OF ITS PHYSIOLOGICAL MECHANISM.

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(Summarized Abstract.)

I. THE ACTION OF ORTHOARTERIOTONY.

The action of orthoarteriotony manifests itself thus: if the tension of the radial pulse is too high it becomes lowered, if too low it becomes increased, and from either deviation it becomes reduced to 150 mm. Hg., or, in stricter terms, to a value higher than 140 mm., not surpassing 150 mm.; gradually the blood-pressure becomes more and more stable, whereby vasomotor tranquillity at a normal blood-pressure level is restored.[1] Such was the action of iodine, constantly recurring in the same manner, when used in accord with the following description, as observed in 98 out of 100 cases of various forms of insanity, during the last 4 years treated by the method hereinafter described.

II. THE DYNAMIC FACTOR OF ORTHOARTERIOTONY.

Schematically, equal amounts of one and the same chemical substance may be conceived as producing different medicinal action, depending upon whether it is chemically engaged by or reacts upon one or another of the constituents of the blood or the tissues after it has been resorbed. Induced by such theoretic anticipation, the author formulated the problem to find experimentally a chemical complex containing iodine and endowed with such chemical affinities that, by its internal use, after resorption, iodine must be combined with or chemically react upon protein in the blood or in the tissues.

With the said purpose in view, the author endeavored to produce a molecular complex of tannin containing iodine, and, after numerous experiments, conducted at intervals during a sequence of years, he obtained as a result a product in which the total amount of iodine and tannin engaged in reaction was taken up in soluble form without any insoluble by-product being precipitated.*

The product thus resulting does not react for free iodine (with starch or chloroform), and does not contain any inorganic base. It can be identified by the fact that a solution of it takes up to a perfectly clear and transparent fluid an amount of nitrate of silver corresponding to 9-10 of the equivalent of the amount of iodine contained in it.†

The chemical constitution of this iodine-containing complex is not known with certainty at present, but it can always be made to contain a definitely known quantity of iodine and tannin; for instance, 1 : 4, or another relation; it may be elaborated into suitable form for intravenous injection or for use subcutaneously or per os.

The complex thus described is exactly the dynamic factor which at the clinical dynamic tests carried on by the author revealed the action of orthoarteriotony in the year 1909,‡ confirmed in the years 1913-1917 by the results of 98 out of 100 cases of various forms of insanity treated with this dynamic factor.§

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* The author's aim to attach organic iodine *in sanguine* and action of such is his reason for describing the iodine-tannin complex used for this purpose.

Numerous products of different procedures containing iodine and tannin, described by various authors, have been used for medicinal purpose since the middle of the previous century. If these products contain organic iodine *in vitro*, or not, has been the subject of investigation by several writers; but that the idea of organic iodine *in sanguine* should have been actualized has not been purported by any writer. Regarding some such iodine complexes, see [illegible] et Loiseau, "Formulaire thérapeutique," Paris, 1903; Power and Sheddon, "The Chemical Character of So-called Iodo-tannin Compounds," Pharm. Journ., xiii, London, 1901; [illegible], "Sur la constitution et l'activité des peptones iodées," Bull. Génér. de Thérapeutique, clxi, Feb. 15, 1911; and other authors.

† The nitrate of silver test, as above, is not described or mentioned previously by writers upon the subject of iodine-tannin products. Guillermond's iodotannin (Journ. de Pharm. et de Chimie, 3me Sér., xxiv, 1851) gave [illegible] of nitrate of silver a precipitate of iodide of silver, when a sample of this preparation, bought in a drug store, was tested by the author exactly as mentioned above. As is well known, soluble iodides and hydriodic acid give precipitate of iodide of silver immediately on admixture of nitrate of silver.

‡ A preliminary report on this observation, made in America, 1909. See "Svenska Läkare-Sällskapets Förhandlingar," Feb. 8, 1910.

§ In Stockholm Hospital for Insane, with consent of chief physician, Dr. B. Gadelius; in Säter Hospital for Insane, with consent of chief physician, Dr. E. Goransson, and his successor chief physician, Dr. A. Grandholm.

III. THE BIOCHEMIC EXPLANATION OF ORTHOATERIOTONY.

Iodide of sodium does not produce the action which characterizes orthoarteriotony. This fact supports, beyond a possibility of doubt, the conclusion that iodine, after resorption of the dynamic factor described (II) has taken place, does not react directly upon carbonate of sodium in the blood to form iodide of sodium, and does not act as such when orthoarteriotony is manifested, but must act through the medium of some other intervening chemical reaction. It follows that first iodine must be taken up by or react chemically upon protein or some other organic molecule in the blood or in the tissues, before it is transformed into iodide of sodium and eliminated as such.

The chemical reaction thus conceived and proved constitutes the proximal biochemic explanation of the action of orthoarteriotony, which is capable of being formulated upon the basis of the author's observations and upon the strength of the facts which he presents in the thesis of which the present article is an abstract. By this biochemic explanation the action of orthoarteriotony is distinguished as caused by a form of energy which is entirely distinct from that which is revealed by the action of iodine, when, after resorption, it directly reacts upon carbonate of sodium[2] to form iodide of sodium and acts as iodide of sodium. Orthoarteriotony is a form of organic iodine action; anorganic iodine action does not produce orthoarteriotony.

IV. THE PHYSIOLOGICAL MECHANISM OF ORTHOARTERIOTONY.

In view of theoretical arguments and experimental findings, the action of orthoarteriotony is interpreted as the result of:

(*a*) Removal of the cause of the blood-pressure disturbance in the cases considered, in that the blood ceases to be charged with chemical vasomotor irritaments as sequel of the action of iodine when, after resorption, it is taken up by or chemically reacts upon protein or another organic molecule in the blood or in the tissues before it is ultimately transformed into iodide of sodium.

(*b*) The automatic regression of the vasomotor mechanism into its normal adjustment (orthoarteriotony) as a sequel to the removal of the cause of the preëxisting blood pressure disturbance (dysarteriotony).

High degree of probability in favor of this interpretation is adduced by the facts presented in the author's thesis.

V. CHARACTER OF ORTHOARTERIOTONY.

In view of the preceding paragraphs (I-IV), the pharmacodynamic action described can be characterized briefly as actiotropic[3] orthoarteriotony through organic iodine action.

VI. QUESTIONS AS YET UNDETERMINED.

The interpretation of the action of orthoarteriotony, which is presented in the preceding paragraphs, leaves undecided the question as to where the freeing of the blood by chemical vasomotor irritaments is brought about:

(*a*) Whether directly in the blood by iodine neutralizing substances, foreign to the blood, acting as vasomotor irritaments;

(*b*) Or if chemical vasomotor irritaments cease to charge the blood as before, as a sequel to the modifying action of iodine upon the metabolism, produced in the cells everywhere in the tissues;

(*c*) Or if iodine produces its action through the intermedium of some one special detoxicant organ.

The last-mentioned alternative seems more probable, but the question is not brought under discussion in this thesis, as the author has not as yet observed new facts of such a nature that by their aid the question last alluded to can be definitely decided.

VII. NOT EVERY SUBSTANCE FOREIGN TO THE BLOOD ACTS AS A VASOMOTOR IRRITAMENT.

Removal from the blood of vasomotor irritaments, as a result of organic iodine action, does not imply that every substance foreign to the blood is being eliminated as result of iodine action. Substances foreign to the blood may be present in the blood without necessarily causing vasomotor disturbances. Several substances foreign to the blood, if present in the blood, alter the blood-pressure and produce dysarteriotony; others, on the contrary, in a given case, do not.

VIII. THE PHARMACOLOGICAL PLACE OF ORTHOARTERIOTONY.

Orthoarteriotony belongs to the forms of iodine action that are peculiar to iodine as such, understood as distinct from action of iodides.[4] The feature of precision in the manifestations of orthoarteriotony, as well as in the technic which brings it about, serves well the purpose of emphasizing and sharply defining the difference between organic iodine action and anorganic or iodide action.

The orthoarteriotony cannot be referred to the same category as the organotropic[5] blood-pressure modifacients (such as digitalis, adrenalin, nitroglycerin, etc.), which, by virtue of direct action upon a distinct function of the vasomotor mechanism, either stimulate or depress the heart or the blood-vessel nerve apparatus.

IX. METHOD OF MEASURING THE TENSION OF THE PULSE IN THE INSANE.

For the purpose of investigating the vasomotor unrest in the insane, and the action of orthoarteriotony, the sphygmometer is to be used as the instrument of measurement, because it is the instrument which is constructed upon the right principle for the purpose of measuring the tension of the radial pulse, *i.e.*, the maximal systolic blood-pressure in the radialis artery.[*]

The essential feature of the sphygmometer method is that the radialis artery gets compressed by means of a pelotte with small compression surface. It must be about the same size as the palpation surface of the index finger, and its pressure must be applied directly over the artery at the point where its pulsations are felt as most superficial. By these precautions all disturbing influence of vascular or muscular reflexes upon the reading of the blood-pressure value on the scale may be completely excluded.

In measuring with the sphygmometer, if proper technical rules are carefully observed, the possible error of observation is less than ten millimeters. This conclusion is based upon the author's experience obtained in making about 40,000 measurements of the tension of the pulse in the years 1904-1917.

X. INCOMMENSURABLE FEATURES OF OTHER METHODS OF MEASUREMENT.

Blood-pressure measurements, by ordinarily used methods other than the syhygmometer, cannot be used in making controlling tests of the vasomotor unrest in the insane and the action of orthoarteriotony, and this for forcible reasons which may be briefly stated as follows:

(*a*) The sphygmomanometer method, according to Riva-Rocci, or any modification of this method (compression of the upper arm by a cuff of 5-16 cm. breadth), cannot be used for the purpose under consideration for the reason that by this method it is not possible to measure the maximal systolic blood pressure in the radialis artery in the insane, as in place of it is obtained the cipher value of a fraction of the blood-pressure in the brachialis artery.

Owing to the high degree of lability of the blood pressure in the vast majority of the insane, the cipher value which is obtained in measuring with the Riva-Rocci method expresses the residual blood pressure which remains in the brachialis artery after withdrawal of a greater or smaller portion of the actual blood-pressure as effected by the technic of this method of measurement. The change in the blood-pressure is brought about through the influence of reflexes, vascular or muscular or both, which are elicited by the cuff compressing the arm by virtue of the irritation produced upon the soft parts of the arm submitted to pressure by this method.

If, notwithstanding this objection, the attempt is made to measure the tension of the pulse in the insane by means of a sphygmomanometer with the cuff 15 cm. broad, the error of observation is more than 40 mm. Hg. in the acute and subacute cases, and the deviation from the actually existing maximal systolic blood-pressure may amount to 120 mm. Hg., according to the author's observations; possibly the error of observation may attain still higher cipher value[†] in some exceptional case.

(*b*) Blood-pressure experiments on animals, according to ordinary laboratory method, cannot be used in making controlling tests of the action of orthoarteriotony by organic iodine action, for the following reasons:

During the experiment in the laboratory the animal is in a state of narcosis and experimental shock while the blood-pressure test is being performed. In consequence, the blood-pressure of the animal is low, more or less approaching the collapse pulse. The cause of this blood-pressure disturbance in the animal experimented on is of quite a different nature from the cause of the vasomotor disturbance in an insane person *in natura*. Thus, the blood-pressure of the experiment animal presents a problem incommensurable with that of an insane person *in natura*, whose blood-pressure disturbance, for the greatest part, is caused by vasomotor irritaments in the blood derived from anomalies of metabolism and secretory disturbances. Conclusion from the former upon the latter will prove fallacious.

XI. FORMER ATTEMPTS TO STUDY THE BIOCHEMIC REACTIONS OF IODINE AFTER RESORPTION, BY EXPERIMENTS IN VITRO.

The biochemic explanation of orthoarteriotony, as depending upon chemical interaction of iodine and protein or other organic molecules in the blood or in the tissues, cannot be controlled or determined by laboratory tests *in vitro*, such as previously attempted. Experiments with hen albumen or blood serum and iodine *in vitro* have been made and repeated during the last 70 years without any practical purpose attained as far as the question under discussion is concerned.

Such findings as have been made have always been capable of being interpreted in various ways and have resulted only in hypotheses[6] which remain unproven.

XII. SUPPLEMENTARY EVIDENCE FROM THERAPEUTIC OBSERVATIONS.

Observations of therapeutic effects may be used to supplement and further to support the action of orthoarteriotony as depending upon organic iodine action and as contradistinct to anorganic or iodide action.

XIII. VASOMOTOR TRANQUILLITY AT NORMAL BLOOD-PRESSURE LEVEL MAY BE MAINTAINED THROUGHOUT THE WHOLE COURSE OF EVOLUTION OF ALMOST ANY[‡] CASE OF INSANITY, IF REQUIRED.

Examples of vasomotor unrest in the insane and of orthoarteriotony, by virtue of organic iodine action, are represented by the accompanying diagrams.

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[*] This statement does not refer to any special signature or trademark, but it refers to any instrument constructed with precision upon the principle of the sphygmometer.

[†] A fuller discussion of this subject and a presentation of facts in support of the statements above are found in the author's article: Clinical Arteriotonometry (soon to appear in print).

[‡] Exceptions make a small proportion of all cases tested.

By the use of iodine, as described in the author's thesis, it is within the power of the physician to cause the evolution of symptoms of the insane to develop throughout its whole course in a state of vasomotor tranquillity at normal blood pressure value, if in a given case he chooses to do so. The therapeutic advantage of this measure is not discussed in this thesis. Orthoarteriotony, by virtue of internal use of iodine "lege artis," is obtained as surely as anesthesia is obtained by proper use of ether or chloroform, according to rules of the art.

XIV. EXPLANATION OF THE FOLLOWING BLOOD-PRESSURE DIAGRAMS.

⊙ Signifies the cipher value of the tension of the radial pulse under the influence of organic iodine action.

● Signifies the cipher value of the tension of the radial pulse without influence of organic iodine action.

It is to be observed that, inasmuch as the diagrams express centimetric and not millimetric units, the cipher value of 150 mm. represents all values that are higher than 140 mm., but not higher than 150 mm.

If, instead of the present, a diagram of millimetric units were to be constructed, then orthoarteriotony would not be represented by a straight horizontal, but a zigzag line in the interspace between the lines of 140 and 150 mm.

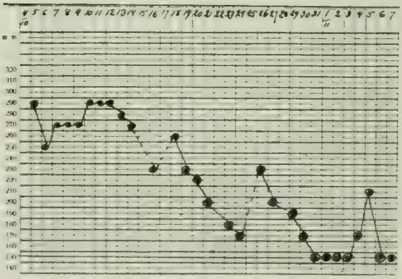

Diagram 1. Mania.

No. 624, Säter Hospital; man, 38 years, entered the hospital July 29, 1915; onset of the disease 12 years before entry, periodical evolution.

Present symptoms. Hilarious, cannot keep quiet nor keep his mouth shut; stream of words swift, voice loud, gesticulates, swears, screams, threatens; spiteful, discontented, disturbs the others, is lodged in the department for the violently insane and dangerous.

Tension of radialis artery. High degree of vasomotor unrest at high hypertension level.

Treatment. *Organic iodine action* from October 19, 1916, to January 20, 1917§ together with treatment as otherwise indicated.

Development. *Orthoarteriotony* from October 31, 1916; from middle of December quiet, obedient, works, helpful; from December 1, 1916, transferred to the wards for half-quiet patients.

No. 727, Säter Hospital; man, 70 years, entered the hospital May 20, 1916; onset of the disease 6 months before entry; no previous attack of mental disease.

Present symptoms. Sentiment changeable, mostly depressed, persecutory ideas, hallucinations of sight and hearing, believes himself to be accused of crime and that he shall have to meet capital punishment; weeps, memory impaired, can retain a number containing 3 ciphers, not a number containing 4 ciphers; motor control.

Tension of radialis artery. Vasomotor unrest at hypertension level.

Treatment. *Organic iodine action* June 13 to September 10, 1916, together with treatment as otherwise indicated.

Development. *Orthoarteriotony* from June 30 to the day of leaving the hospital; from early in September good mental equilibrium; no hallucinations, no false ideas, memory improved, can retain a number containing 5 ciphers; has good insight concerning his having been mentally ill; discharged from the hospital September 10, 1916, cured.

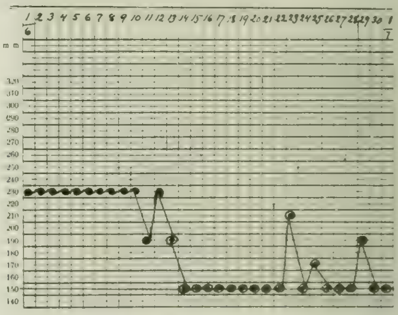

Diagram 2. Melancholia in Senium.

No. 482, Säter Hospital; man, 68 years, entered the hospital October 16, 1913; onset of the illness 4 months before entry; no previous attack of mental disease.

Present symptoms. Sentiment changeable, sometimes glad, sometimes depressed; without foundation accuses his wife of infidelity; has acted in a confused manner and with poor judgment in business matters; squandered his property; is angry with relatives; preaches, sings, weeps; memory impaired; often noisy and turbulent.

Tension of radialis artery. High-grade vasomotor unrest at a high hypertension level, during more than a year continuing to be of about the same character as the diagram indicates.

Treatment. *No* organic iodine action; *no* orthoarteriotony.

Development. Dementia, no spontaneous change in the character of the pulse tension.

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§ This case is an exception to the author's other cases hitherto treated by this method in so far as the patient has a vitium cordis and albuminuria; the treatment has not been intense, as it is not yet decided whether such complication is a contraindication to orthoarteriotony treatment.

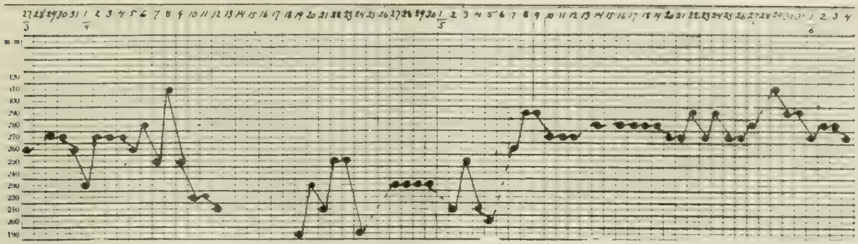


Diagram 3. Dementia Senilis.

No. 4198, Stockholm Hospital; man, 21 years, entered May 26, 1913; onset of the disease a few days before entry; no previous attack of mental disease.

Present symptoms. Quiet, lucid, but very slow in speech and general motility; answers questions briefly, in few words, little more than "yes" and "no"; looks astonished, embarrassed; knows hardly what to say or to do; reconvalescent.

Tension of radialis artery. Vasomotor unrest at low hypertension level.

Treatment. *Organic iodine action* from August 8 to October 14, 1913, together with treatment as otherwise indicated.

Development. *Orthoarteriotony* from August 8 to the day of leaving the hospital; discharged October 19, cured.

No. 3244, Stockholm Hospital; woman, 21 years, entered the hospital June 10, 1908; onset of the disease 3 months before entry.

Present symptoms. Stupor, mutismus, stolid face; needs to be helped in everything, must be fed by the attendants.

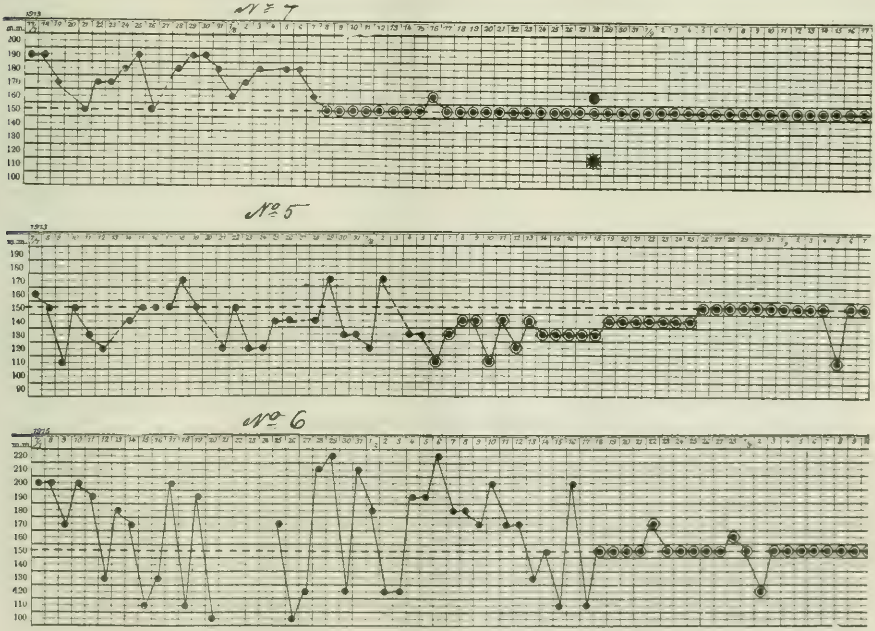
Tension of radialis artery. Vasomotor unrest in hypotension, approaching the normal blood-pressure level.

Treatment. *Organic iodine action* from August 6 to October 5, 1913, together with treatment as otherwise indicated.

Development. *Orthoarteriotony* from August 26 to October 5, 1913; no change in the mental symptoms.

No. 481, Säter Hospital; woman, 45 years, entered the hospital January 5, 1914; onset of the disease two years before entry.

Present symptoms. Depression, anguish, com-



Diagrams 4, 5, 6. Praecox.

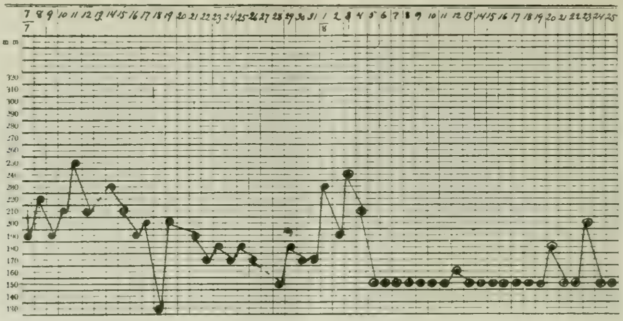


Diagram 7. Praecox.

plaining, sobbing talk, psychomotor agitation, persecutory ideas, hypochondriac ideas, sense perception of being transformed.

Tension of radialis artery. Vasomotor unrest with large changes between hypertension and hypotension values.

Treatment. Organic iodine action from February 18 to March 11, 1915, together with treatment as otherwise indicated.

Development. Orthoarteriotony from February 18 until the day of leaving the hospital. From beginning of March more tranquil as regards sentiment and mobility; the treatment was discontinued owing to the transference of the patient to another hospital on March 11, 1915.

No. 4161, Stockholm Hospital; woman, 20 years, entered the hospital April 23, 1913; onset of the disease 2 months before entry; no previous attack of mental disease.

Present symptoms. Face pale without expression, stupor, mutismus, negativismus, muscular tenseness, flexibilitas cerea; must be fed through the rubber tube, needs to be helped in everything.

Tension of radialis artery. High-grade vasomotor unrest at hypertension level.

Treatment. Organic iodine action from August 3, 1913, until February 2, 1914, together with treatment as otherwise indicated.

Development. Orthoarteriotony from August 24, 1913, until February 2, 1914, on which date the patient was discharged from the hospital and removed to a private home; no improvement in psychic symptoms having yet occurred; later on improvement developed; she is now (1917) well and able to attend to her regular occupation.

No. 3673, Stockholm Hospital; man, 35 years, entered the hospital September 13, 1911; onset of the disease 2 years before the entry, no previous attack of mental disease.

Present symptoms. Short, tranquil periods alternate at regular intervals with more prolonged periods of unrest, increasing to outburst of violence with hallucinations and false ideas; during the periods of the diagram, when the tension of the pulse approaches the normal value (*i.e.,* 28-6, 11-7, 28-7, 11-8, etc), the patient is quiet and lucid. When, thereafter, the tension of the pulse increases, unrest soon begins to set in, which gradually increases and grows into the most violent psychomatoric agitation with vivid, changeable hallucinations, false ideas of frightful, terrorizing nature, intense anguish and muscular tenseness; during the days which are marked on the diagram with parenthesis, the patient must be tended to in an isolation cell in the section for the violent insane; then it takes several powerful men to restrain him from violent acts and to keep him down in bed; between-times (days not marked with parenthesis) he resides in a private apartment in the department for quiet patients and occupies himself with sloyd

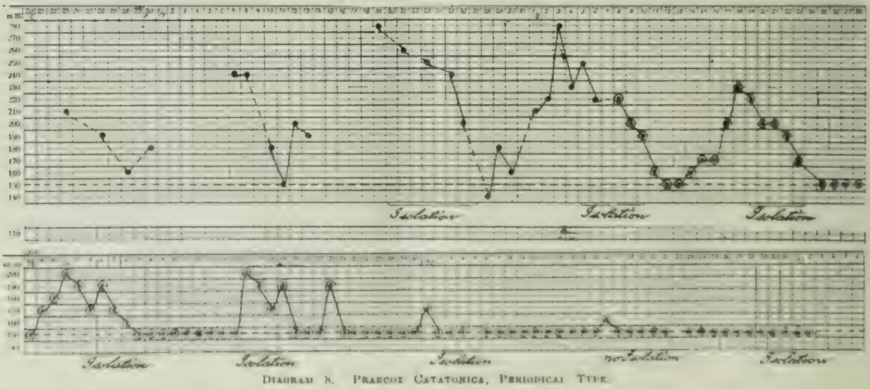


Diagram 8. Praecox Catatonica, Periodical Type.

work, reading—even with scientific problems of high order; or he goes to the hospital chapel, sits at the piano and plays classical music; on few of his most tranquil days he receives visits by friends and some days he can even make visits to relatives in the city.

Tension of radialis artery. High-grade vasomotor unrest with a periodicity which exactly follows the periodicity of the psychic symptoms described above; at regular intervals of 14-16 days the tension of the pulse gets spontaneously approximately normal, *i.e.,* 150 mm., or near this figure, and simultaneously psychic quiet and lucidity set in; the following day the tension of the pulse begins again to increase and it increases more and more on the subsequent days; when the tension of the pulse has attained 200-230 mm. the unsettling of the psychic synthesis begins with increasing unrest which, some days later, after the tension of the pulse has reached its highest value, 280 mm., attains its maximum of violence and remains violent during the next following days, while the tension of the pulse begins to decrease; between the highest points of the blood-pressure (19-7, 3-8, 18-8, etc.) the alternating periods are of equal duration—about 15 days.*

Treatment. Organic iodine action from August 8 to November 2, 1913, together with treatment as otherwise indicated; the iodine treatment was discontinued from November 3, 1913, for incidental reasons.

Development. Orthoarteriotony from September 24, 1913; the vasomotor unrest became gradually reduced, with intensity maximum still recurring at regular intervals, coinciding with the preceding periodicity; the quiet periods became gradually lengthened, the violent periods gradually shortened; the restraint in the isolation cell, which before the orthoarteriotony treatment used to have a duration of 7 days or more, was now gradually shortened, and on October 16 it was found safe to dispense with it entirely. In the condition of the patient a further progressing improvement entered subsequently. On the 15th of July, 1916, he was discharged from the hospital cured, and he has since resumed the practice of his scientific technical profession.

No. 743, Säter Hospital; youth, 17, entered the hospital July 18, 1916; onset of the disease one year before entry; no previous attack of mental disease.

Present symptoms. Stupor, mutismus, stolid face without expression; can eat without help, must be helped in everything else.

Tension of radialis artery. Vasomotor unrest at hypotension level.

Treatment. From January 9, 1917, *organic iodine action,* together with treatment as otherwise indicated.

Development. Orthoarteriotony from January 10, 1917; the treatment still continues (June, 1917); the patient can move slowly about, can help himself in everything and can do simple needlework; he is still mutistic, but his face expresses interest and ordinary feeling in relation to his surroundings; he is gaining in weight, and the author considers his prognosis to be hopeful as far as the present attack is concerned.

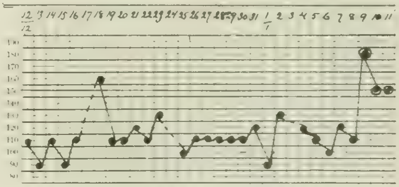


Diagram 9. Praecox.

No. 584, Säter Hospital; man, 26 years, entered the hospital March 20, 1915; onset of the disease two years before entry; no previous attack of mental disease.

Present symptoms. Sentiment apathetic, incidental outbreaks of wrath from inner motives; not susceptible to impressions from the environment; persecutory ideas, suspects poison to have been mixed in his food; thinks he has been able to read other persons' thoughts; motor unrest; jumps out of bed often; scoffs and swears under influence of his false ideas.

Tension of radialis artery. High grade of vasomotor unrest at hypertension level of 230-240 mm. Hg., sometimes higher or lower, remaining throughout 1915-1916 and continues yet (in February, 1917).

Treatment. No organic iodine-action, *no* orthoarteriotony; treatment as otherwise indicated.

Development.. Dementia; no spontaneous change of the blood-pressure.

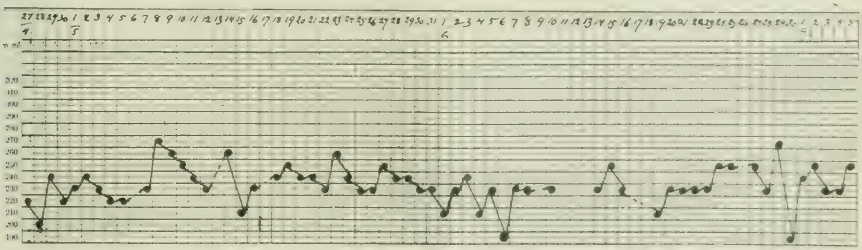


Diagram 10. Praecox.

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* Details of the vasomotor diagram vary greatly in different cases of praecox of periodical type. Such remarkable regularity and coincidence between the periodicity of the psychotic symptoms and the vasomotor manifestations as the case above presents has not as yet been observed by the author in another similar case.

But in all cases of periodical praecox, hitherto observed by the author, vasomotor tranquillity at normal blood-pressure-level has developed simultaneously with the development of a remission in the psychotic symptoms.

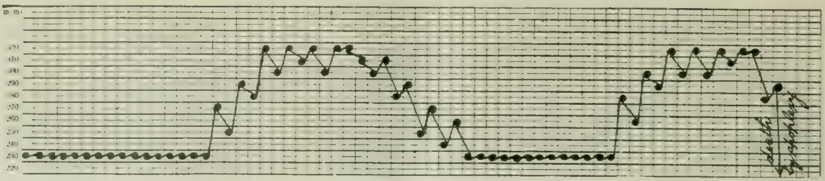

Diagram 11. Dementia Organica. Apoplexy.

No. 4226, Stockholm Hospital; man, 52 years, entered the hospital October 2, 1913; onset of the disease three months before entry; no previous attack of mental disease.

Present symptoms. Apoplectic stroke twice during the time, which is represented on the diagram.

Tension of radialis artery. The diagram gives a condensed schematic representation of the development of the blood-pressure during the last four months before death; the apoplectic strokes occurred during the latter part of the rise of the blood-pressure to about 290-320 mm. Hg.

Development. Died February 27, 1914; at the post-mortem examination recent large cerebral hemorrhage; several sections of the brain discolored from previous, smaller blood-extravasations.

No. 748, Säter Hospital; man, 28 years, entered the hospital September 2, 1916; four months before entry he had killed a man by a blow from a hatchet and shot a young woman with his revolver; transferred to the hospital by order of the court for observation and report as to his mental condition.

Present symptoms. The patient, who is a merchant of good family, good education, and good social relations, is not insane in the ordinary sense, but suffers from neurasthenia.

Tension of radialis artery. Vasomotor unrest at hypertension level; the lability of the pulse expresses itself also in large, often occurring changes in the frequency, generally varying between 80 and 120, most often about 100; at occasions, which recur at intervals quite often, it is enormously increased, so that sometimes it is difficult to count the frequency. For instance, on October 14, with a tension of the pulse of 250 mm., the frequency was 148; Oct. 19, with a tension of 250 mm., the frequency was 168; Oct. 20, with a tension of 280 mm., the frequency 160; and Oct. 29, with a tension of 250 mm., the frequency was 136.

At so high a frequency, in connection with so high a blood-pressure as, for instance, on October 19 and 20, the pulse makes to palpation the impression of a vibrating cord and gives one the impression of clonic cramp in the artery. As already mentioned, this phenomenon was observed four times from October 14 to 29.

Development. No spontaneous relief in the blood-pressure; on January 20, 1917, the city court of Stockholm sentenced No. 748 to death for murder in the first degree; the patient has appealed to the superior court and, upon the basis of the medico-legal report,† requested that the crime diagnosis of the city court be changed to manslaughter.

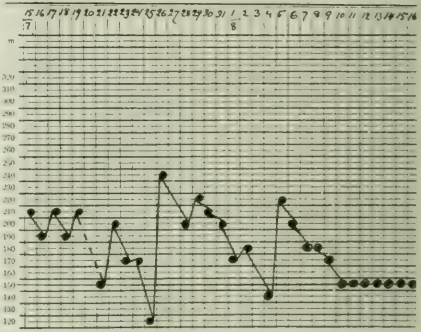

Diagram 13. Dementia Paralytica.

No. 4209, Stockholm; man, 46 years, entered the hospital June 20, 1913; onset of the disease one month before entry; no previous attack of mental disease.

Present symptoms. Confusion of ideas, high sentiment alternating with sorry mood and weeping; wants to make speeches, make up rhymes, improvise poems, recite; high-grade motor unrest, dis-

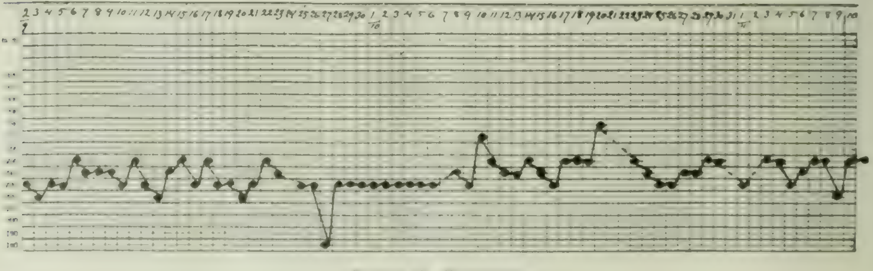

Diagram 12. Neurasthenia.

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† The report of chief physician, Dr. Granholm, is an official document which will be printed in "Meddelanden fran Kungl. Medicinalstyrelsen, Rättspsykiatriska rettatander avgifna ar 1916.

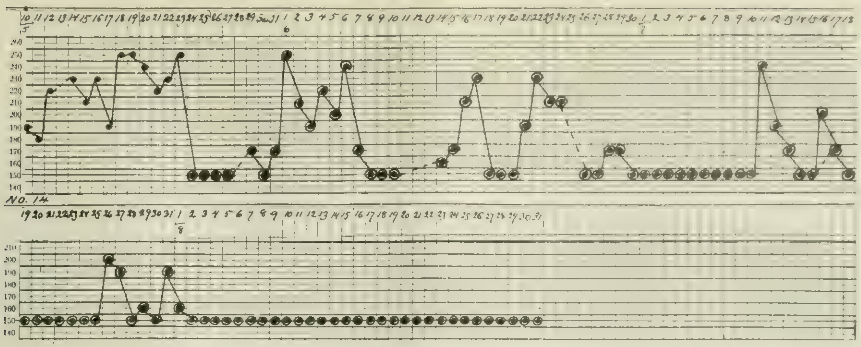

Diagram 14. Insania Epileptica Imbecillitas.

turbances of speech (lues in the anamnesis), stale pupils, patellar reflex abolished.

Tension of radialis artery. High grade of vasomotor unrest at hypertension level.

Treatment. Organic iodine action August 7 to September 24, 1913, together with treatment as otherwise indicated.

Development. Orthoarteriotony from August 10 until leaving the hospital; from end of August improvement, which progressed rapidly; in third week of September lacking insight in his illness, otherwise free from psychotic symptoms; after leaving the hospital he had been able to manage his banking business; died 1916.

No. 99, Säter Hospital; youth, 15 years, entered the hospital April 10, 1912; from birth mentally below ordinary standard.

Present symptoms. From the age of 11 years epileptic attacks, morally defective, has no idea of right or wrong.

During his stay in Säter Hospital the patient has taken bromide of sodium from 3 to 6 grams daily; with this amount of bromide of sodium the epileptic seizures have varied from one to nine per month; in May, 1915, bromide of sodium was omitted, and this month the number of seizures was 14, of which 11 occurred in the night time and 3 in the daytime.

Tension of radialis artery. High grade of vasomotor unrest at hypertension level.

Treatment. Organic iodine action from May 24 to Aug. 31, 1915; *no* bromide.

Development. Orthoarteriotony from Aug. 1 to Aug. 31, 1915; after the first dose of iodine the tension of the pulse decreased from 250 mm. to 150 mm. Hg., but every time an epileptic seizure occurred the blood-pressure increased the same day or next, following to 250 mm. or a lower hypertension value; in a measure, as the number of the seizures decreased, the tension of the pulse became more stable; the number of seizures amounted in May to 14, in June 9, in July 8, in August 0. *In August orthoarteriotony and no seizures,* although no bromide was used. This case has given impetus to further experimental work, which possibly may bring future result.

Note. The preceding article is a summarized abstract of a larger thesis on the same subject, under the same title, which will soon be ready to be printed. In it all the facts are presented which are necessary for the purpose of substantiating the statements made above.

The leading aim of my thesis is to present and describe the facts of *orthoarteriotony, a form of medicinal action which has not been observed and is not described in the pharmacological literature up to the present.* In the thesis the biochemic explanation of this form of action is more fully discussed, and facts are presented which, to a high degree of probability, support the physiological interpretation of its mechanism, as offered above.

Besides, a full description is given of all technical details, chemical and clinical, which will enable every physician to avail himself of the action of orthoarteriotony, if he chooses to do so.

It is the author's intention, on a future occasion, to present still another series of facts concerning orthoarteriotony in relation to mental diseases. Thereafter, it may be possible to begin to discuss the significance of orthoarteriotony for the study of the mechanism of certain forms of mental diseases and also to foreshadow the prospective value of orthoarteriotony in relation to therapy of insanity and to mental economy.

The problems which I discuss under the title of orthoarteriotony belong to the frontier territory between the provinces of medicine and chemistry. In these problems, medical questions are so intimately interwoven with chemical questions that after years of labor, I am convinced of the impossibility of solving these problems strictly within the province of either chemistry or medicine separately. Attempt to distinguish organic iodine action from inorganic iodine action by ordinary methods of analytical chemistry will be found as fallacious as should be an attempt by such method to distinguish diphtheria antitoxin from tetanus antitoxin. Here the clinical dynamic investigation has proven to be the only efficient method leading to decisive results. Here it is not a question of prescribing on the one side and making up the prescription on the other. Here the question has been through and through to penetrate the darkness of the unknown with the means of investigation offered by any branch of science that could lend an assistance to the purpose, and thus to pave the path and kindle the light that shall make further progress by other investigators easier.

Regarding some or another detail in my discussion, different shades of view might perhaps be suggested. However that may be, two facts I purport to have established with certainty:

1. Orthoarteriotony, technically capable of realization through the action of iodine as surely as anesthesia is technically capable of realization through ether or chloroform, the purpose can invariably be attained by strictly following

the technical rules which emerge from my experimental findings and which I have formulated in my thesis.

2. Orthoarteriotony is not produced by anorganic iodine action, *i.e.*, is not iodide action, but it is a form of organic iodine action, *i.e.*, a result of chemical interaction of iodine and protein (or possibly some other organic molecule) in the blood or in the tissues.

REFERENCES.

[1] Compare Enebuske: Von der vasomotorischen Unruhe bei Geisteskranken. Zeitschrift für d. Ges. Neurologie und Psychiatrie, Berlin, 1916, xxxiv, 5, p. 459. *Idem.*: Vasomotor Unrest in the Insane, BOSTON MEDICAL AND SURGICAL JOURNAL, March 15, 1917.

[2] Compare H. Nothnagel u. J. Rossbach: Handbuch der Arzneimittellehre, Berlin, 1880, p. 259; R. Kobert: Lehrbuch der Intoxikationem, Stuttgart, 1904, ii, p. 184; A. Arnozan: Précis de Thérapeutique, Paris, 1903, i, p. 212; and others.

[3] Compare H. Meyer u. R. Gottlieb: Die experimentelle Pharmakologie, Berlin u. Wien, 1914, p. 484.

[4] Compare A. Hefter: Über Jodwirkung, Medizinische Klinik, Berlin, 1910, No. 8.
C. Enebuske: om verkan av jod; Svenska Läkaresällkapets förhandlingar, Stockholm, November 29, 1910.
H. Meyer u. R. Gottlieb: Die experimentelle Pharmakologie, Berlin und Wien, 1914, p. 383, and other authors.

[5] Compare H. Meyer u. R. Gottlieb: p. 484, (*loc. cit.*)

[6] Compare: Précis de Thérapeutique, par A. Arnozan, Paris, 1903, T, p. 212: "Introduit dans le sang, ce metalloid s'y combine avec le sodium et y circule sous forme d'iodure de sodium. Mais il n'est pas démontré, qu'il ne forme pas des combinations spéciales avec les albuminoides. ......on en est réduit sur ce point a des hypothéses on a des expériences *in vitro* toujours sujettes à des interprétations différentes."

TENDON SUTURE.

BY TORR WAGNER HARMER, M.D., BOSTON.

UNRETARDED strong healing of severed tendons after suture depends upon careful approximation of the severed ends by a stitch which will not destroy many tendon fibers either by transfixing or constricting, and so placed that it will not pull out with early use of the tendon. In certain situations, such as the wrist, early function is imperative in order to avoid fixation of the tendons by adhesions. The original wound and the traumatism of operation, however slight, including the suture of the tendon itself, will be followed by more or less connective tissue formation. If a suture is not sufficiently strong to endure very early use, this connective tissue formation may seriously fix the tendon to surrounding tissues. The liberation of the tendon may require weeks of massage and manipulation, and perhaps complete function may never be attained.

Since 1909 I have employed a method of treating severed tendons which may not be new, but has not been known to a number of surgeons with whom I have spoken. The series of cases is not large, but the results have been sufficiently satisfactory to commend the method. The severest test I am herewith reporting,—suture of twenty-four tendon ends on the anterior surface of the wrist three days after injury.

The stitch is of silk and consists of overcasting the lateral margins of both ends of the divided tendon. The overcasting starts about the width of the tendon or a little more back from the point of division, and comprises several whippings about the side of the tendon down to the line of division, each loop including somewhat less than one-quarter of the circumference of the tendon. When a tendon is ready to be brought together, each end then carries two stitches and each stitch two ends, as is shown in Fig. A. In this figure, although the short ends are shown partly knotted, they have been represented still threaded in the needles in order to indicate the directions in which the stitches have been placed. The full length of the long ends has not been shown in order to simplify the diagram. If there is more than one tendon severed, stitches are placed on all before any are tied. The two parts of the tendon are now brought together and the two suture-ends nearest the line of division on one side are tied. The two longer ends on the same side are then tied. The two pairs of stitch-ends on the other side are then similarly tied. In Fig. B the constrictions of the edges of the tendon beneath the overcasting stitches have been purposely exaggerated. In this figure both pairs of short ends have been tied, one pair of long ends is being tied, the other pair of long ends has been tied but is out of view on the under surface of the tendon. The long ends so tied alongside the tendon seem to serve as lateral splints. The objection that they occasion too much suture material in the wound is refuted by the fact that I have never seen any harm from them. It is likely that these lateral stays become incorporated with the sides of the tendon just as silk grafts in tendon lengthening. Sometimes after tying the stitch, the severed ends, although in contact, may slightly buckle. This is occasioned by tying the long suture ends too tightly. They should simply be made taut. If this error has been made, it may readily be corrected by placing a simple stitch between the tendon ends. There is no tension on this simple stitch. It merely closes the gap caused by the buckling. Fig. C is a side view of a sutured tendon. It shows how the tying of the two shorter ends tends to splint the tendon on its upper surface, and how the tying of the two longer ends tends to splint the tendon on its under surface. The tendon shown is a well-rounded one, and consequently the overcasting includes only a part of the lateral margin. In case of a flat tendon it would include practically the whole thickness of the lateral margin.

A dry wound before closing is desirable. Seeping or actual hematoma will probably limit the amount of motion at first, may favor the production of adhesions, or may encourage infection. It is important, then, to stop all bleeding, using as little material for ties as possible.

Care is taken in closing the wound to approximate the fascia and skin separately. *No splint is used.* Active motion is started as soon as the patient has recovered from the anesthetic. This will never be too energetically done on account of the pain which it causes. The dress-

Diagram of Method of Suture.

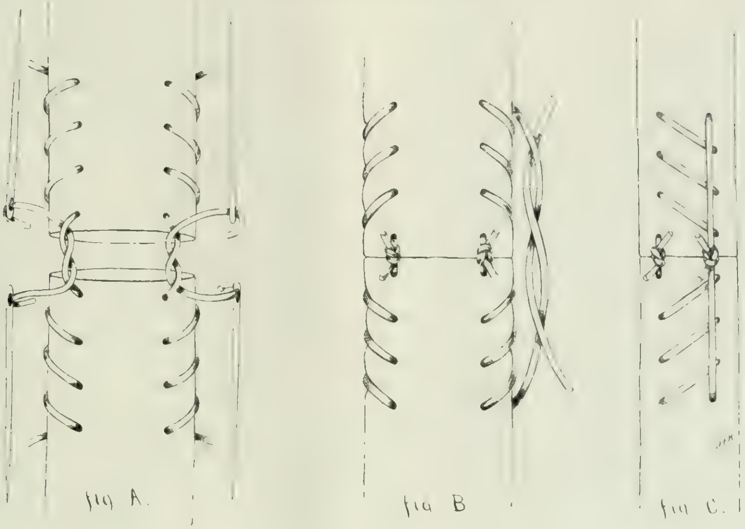

fig A. fig B fig C.

Suture of All Flexor Tendons 23 Days after Operation.

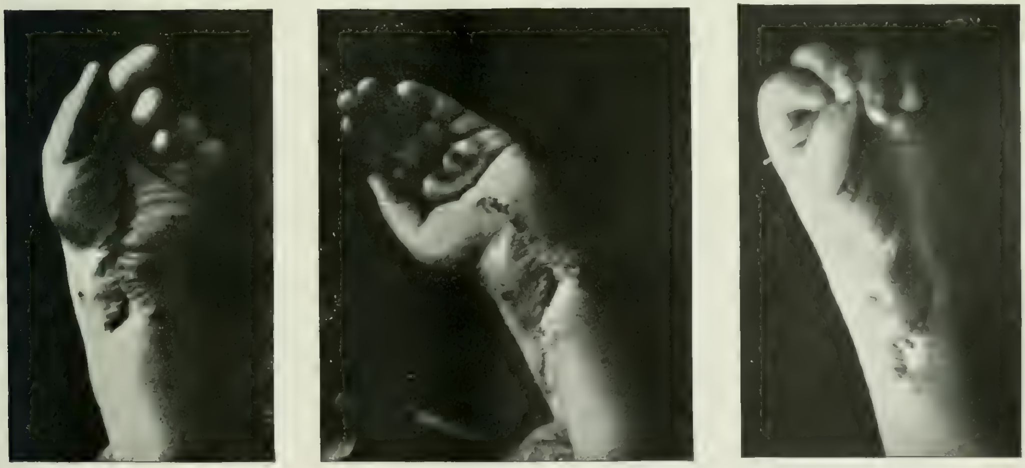

Fig. 1 Fig. 2 Fig. 3

Suture of All Flexor Tendons—15 Months after Operation.

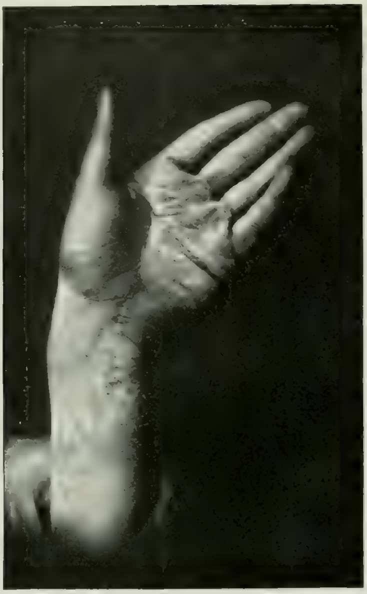

Fig. 4.

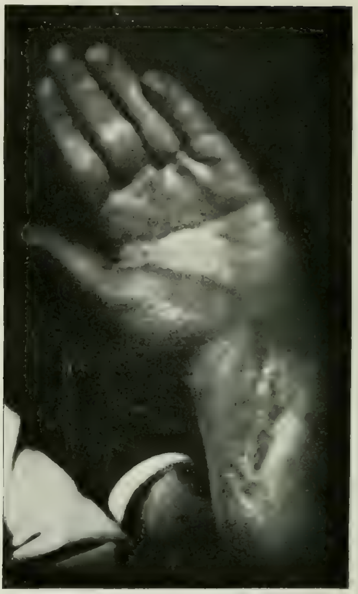

Fig. 5.

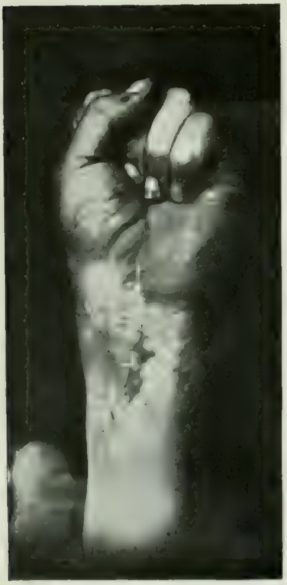

Fig. 6.

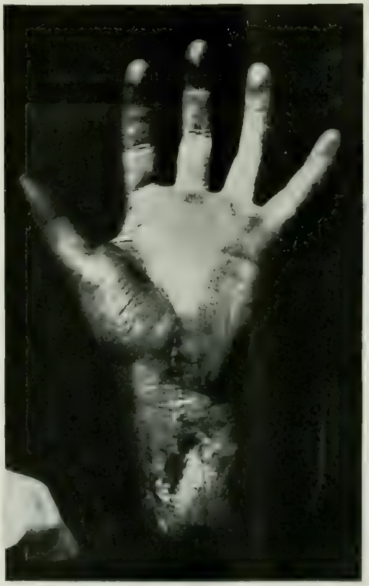

Fig. 7.

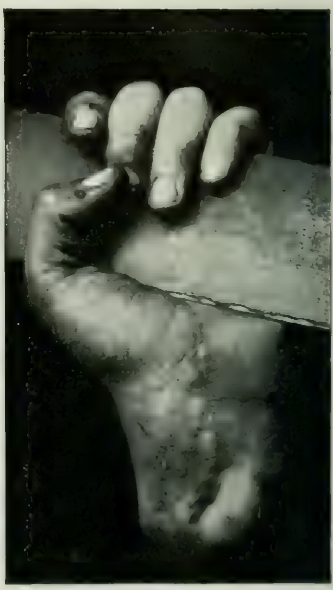

Fig. 8.

ing is rapidly reduced in bulk during the next few days so as not to interfere with motion. In a day or two the part is gently moved passively to allow the patient to see the amount of motion that can be accomplished. After three or four days of active motion he is permitted to use passive motion in addition. Even children, if properly handled, can be persuaded to tolerate the slight pain which active motion causes.

At the Children's Hospital on October 14, 1915, I saw a lad of five years who had fallen three days previously upon a milk bottle, lacerating the anterior surface of his forearm just above the wrist. Immediately after the accident, a physician had made an attempt to repair the wound, but it was quite obvious from the boy's disability that probably only a few superficial tendons had been united. Accordingly, under ether and ether-iodine preparation, the wound was reopened. The hospital record of the operation follows:

> "Left forearm presents lacerated wound extending from about center of ulnar side downward to within 2 ins. of annular ligament in median line, then upwards and outwards for about 2 ins. There present in the wound the median nerve and the ulnar nerve, somewhat frayed. The tendons of the flexor carpi radialis, palmaris longus, of the sublimis, of the profundus and the flexor carpi ulnaris lay severed. The flexor longus pollicis is partly severed. The ulnar artery is severed. Lower ends of the superficial tendons had receded about 1 in. distally, but the deep tendons had receded under cover of the annular ligament, as was shown by a vertical incision carried from the V-point of the lacerated wound downwards into the palm, through the annular ligament. To the end of each tendon was fastened, on either side, a silk suture overcasting the lower margins. The 24 tendon-ends were approximated; the annular ligament brought together with No. 0 chromic, fascia similarly sutured. Silkworm gut to skin. Dry dressing; bandage; to ward in good condition. Time: two hours and ten minutes. No splint was applied and in the afternoon the boy was encouraged to use the fingers at once."

It is remarkable that the median nerve was not severed when the flexor carpi radialis and palmaris longus were completely severed and the flexor longus pollicis partly so.

Before placing any stitch on any of the tendons, and before moving any of the tendons from the position in which they lay, the wound was enlarged as much as was thought necessary. The tendons were then viewed as they lay, first the proximal group, then the distal group. Not a single tendon-end was disturbed until a decision had been reached regarding the identity of each end. Then before any tendon was moved, the pictures which the proximal and distal groups presented were visualized. The tendon-ends were then picked up one at a time, and the stitches placed first in the proximal and then in what was considered the distal end of each tendon. The ends of each tendon were then laid aside and their identity preserved by placing a certain number of hemostats or similar kinds of hemostats on the suture of each end. When all the tendon ends had been supplied with suture ends, they were tied together from within outwards. The annular ligament, fascia, and skin were closed as above noted. In order to test what I was convinced to be true from previous experience in less extensive tendon injuries, no splint was applied, and in the afternoon a special visit was made to the hospital to instruct and encourage the lad to use his fingers.

The house officer's post-operative notes follow:

> "Oct. 15, 1915. Patient operated on yesterday. Boy uses fingers almost constantly as directed. All the tendons seem to be properly united. Upon forcible flexion (passive) of the fingers a snap was heard in the forearm. Patient allowed up with sling. Wound dressed and found to be clean.
>
> Oct. 16. On examination of the fingers today it was found that the suture of flexor profundus indicis must have been loosened or drawn out yesterday when the snap occurred.
>
> Oct. 18. Patient doing well. Wound not redressed. Patient is up and about with arm in sling. Is using fingers constantly. Hand shows some general swelling but otherwise seems in good condition.
>
> Oct. 21. Dressing done today. Wound clean and healed. Active motion increased in amount.
>
> Oct. 24. Stitches removed today. Wounds healed save for small area at tip of transverse flap. Dry dressing applied.
>
> Oct. 27. Boy shown before Clinical Congress of Surgeons. All movements present except flexion of distal phalanx of index finger.
>
> Oct. 29. Patient discharged home today. Result excellent. Has good functional result of all tendons save of the flexor profundus of first finger. To return to the Surgical O. P. D. for observation."

Twenty-three days after operation, a series of photographs was taken (Figs. 1, 2, 3, to illustrate the amount of motion of wrist and fingers. They show the original V-shaped lacerated wound and the incision made distally from the point of the V through the annular ligament. About this time the boy was placed in the care of Miss Miriam T. Sweeney, drector of Physical Therapeutics at the hospital. I wish to express my appreciation of her skilful and conscientious treatment, still further encouraging his active motions and directing passive motions and massage. I had a number of patients brought back to the hospital early this year to observe the end-results, among them this boy. A second series of photographs was taken at this time, February 2, 1917, fifteen and one-half months after operation (Figs. 4, 5, 6, 7, 8). No comment is necessary. They show practically perfect function of the wrist and fingers, with the exception of some weakness of the distal phalanx of the forefinger. Flexion of this phalanx can be accomplished, but not so vigorously nor so fully as the other distal phalanges. The boy has been seen again recently (November 12, 1917) twenty-five months after operation. All functions of the hand and wrist are perfect, and flexion of the distal phalanx of the fourth finger is practically complete. The scar is soft and flexible and not adherent.

This case, I believe, illustrates the importance of very early active function. It illustrates also, I believe, the reliability of this stitch, one which may be depended upon to tolerate early function, avoiding the use of splints and obviating in great measure the formation of adhesions. In the wrist and hand limitation of motion may prevent an individual from pursuing his or her vocation or avocation. Anchoring of flexor tendons not only limits flexion but also, to some degree, limits extension. *Vice versa,* limitation of extensor tendons limits not only extension but also, to some degree, flexion. In neglected cases secondary changes in ligaments and joints may follow, which may require the treatment of a skilled mechanotherapeutist before reconstructive surgery is attempted. The identification of tendons, the minimizing of operative traumatism, the preservation of grooves or gutters of tissue about which tendons which work at an angle may play, the use of fascia and fat, make this one of the most practical and fascinating fields of surgery. I have been persuaded by several men to place this case on record, and trust that the method may meet favor in other hands: this stitch, dry wound, separate closure of fascia, no immobilization, and immediate function.

A METHOD OF TESTING THE VASOMOTOR REFLEXES OF THE SKIN AND OF RECORDING THE SAME.

By Edward A. Tracy, M.D., Boston.

All somatic phenomena are worthy of investigation and tabulation. In this way we learn to distinguish accurately what is normal from that which is abnormal. When certain abnormalities are found associated with certain disease conditions we are helped in the diagnosis of these conditions by the presence of the abnormalities.

In studying the reactions in the peripheral blood vessels caused by light stroking of the skin, I came to testing both sides of the face and both forearms (as these parts are readily accessible) and to record the findings in the time-saving manner described below.

In a normal person, when the skin is lightly stroked (with a pressure of about two ounces) there appears on the stroked surface a brief deepening of the skin tint lasting up to 8 or 12 seconds, and then a white streak appears that lasts for a couple of minutes. That is, in response to light stroking the local blood-vessels in the stroked area, or near by, first dilate and then contract. In a paper published in this Journal Aug. 10, 1916, it was shown that the dilatation of the vessels was caused by stimuli coming over the autonomic fibers of the vegetative nervous system, together with a certain hormone in the blood-stream, and that the vasoconstriction was caused by stimuli coming over the sympathetic branch of the vegetative nervous system, together with adrenin (or its analogue in action—pituitrin) in the blood-stream. A distinctive character in this reaction is that a single stroke of light mechanical irritation evokes a double reflex—that of vasodilation and vasoconstriction, through impulses coming over separate nerve structures—autonomic and sympathetic fibers. Of importance, too, is the fact of the dependence of these reactions upon the hormone content of the blood-stream. There must be a sufficiency of the appropriate hormones in the blood or the reactions fail to appear.

For the reasons mentioned at the beginning of this article, the phenomena of vasomotor reflexes were studied systematically and the findings tabulated.

The method used of testing the reflexes and of recording the findings is as follows: In each case four tests are made: 1. The skin of the left side of the face is stroked, and the length of time the reflex vasodilation lasts and the time it takes the reflex vasoconstriction to appear is noted; this is done with the aid of a stop-watch. The length of time the vasoconstriction lasts is also noted. 2. The same is done for the right side of the face. 3. The left forearm, on the palmar surface, an inch or so from the wrist, is similarly stroked, and the time it takes for the vasoconstriction to appear is noted. The time the vasoconstriction lasts is also noted. 4. The same is done for the right forearm.

The results of the testings are recorded by means of abbreviations, to save time. To illustrate the abbreviations made use of in recording the tests, let us suppose, on stroking the right side of the face, we note that the vasodilation is very brief—less than twelve seconds—and that vasoconstriction appears in twelve seconds and lasts two minutes. These facts are recorded thus: $\overset{d}{\text{rfc}}$ in 12″ = 2′. If the vasodilation is not detectable, we can record this fact by a minus sign after the d, thus: d—. If the vasoconstriction is faint or diffuse we can so denote by the abbreviations f and dif. In some cases in which the vasodilation lasts longer than is normal—twelve seconds—a diffuse vasoconstriction is noticed bordering the stroked area, and a white streak is seen to replace the reddened one. These phenomena can be recorded—to take an example—thus: $\overset{d\,—\,30''}{\text{rfc}}$ in 14″ l 30″ = 3′. This formula signifies that after lightly stroking the right side of the face, reflex vasodilation appeared and lasted thirty seconds and that reflex vasoconstriction appeared in fourteen seconds (bordering the red streak), and that the white line, replacing the red one, appeared in thirty seconds and lasted three minutes. (Parenthetically, I may remark here that the phenomena of vasoconstriction on the borders of reflex vasodilation appear to be due to an overflow of stimuli from the sympathetic fibers to neighboring fibers; the stimuli being prevented from discharging along the regular channels because of the nerve mechanism in the blood vessels being in use for the discharge of autonomic currents, the blocked sympathetic currents readily overflow into neighboring sympathetic fibers—the fibers being sheathless).

On testing the forearm, in general, only the time of the appearance of the reflex vasoconstriction, and the time it lasts, are noted. As a rule, the vasodilation is seen here with difficulty. On the face it is readily observed, and, lasting over twelve seconds, is, I have found, of pathologic import. It is convenient to stroke the skin on the palmar surface of the forearm an inch or two from the wrist, because of the presence of hairs and freckles on the dorsal surface which may hinder observation of the phenomena.

The abbreviations used in recording the tests made on the forearms are illustrated in the following examples: If we stroke the left forearm and find that vasoconstriction appears in ten seconds and that it lasts for two and a half minutes, we record the findings thus: lac in 10" = 2' 30"; and similar findings on testing the right forearm are recorded thus: rac in 10" = 2' 30"

In all cases in which the vasoconstriction is pronounced, that is, intense in color, we so denote by underlining the symbol for reflex vasoconstriction, c, thus: c; if it be faint, the abbreviation f after the symbol c denotes that fact. To complete the record of the tests, the hour and date of taking them should be appended.

This method of testing the vasomotor reflexes and of recording the findings was employed by the writer in the hope that the study of the phenomena in a systematic manner might lead to some useful result. Nor has the hope proved fruitless. A study of the reactions in normal and diseased individuals has already led to important findings of use in diagnosis. The method is here offered to the clinician, that tests may be made and recorded methodically in various diseases. A larger knowledge of the phenomena of vasomotor reflexes will thus result, and light will be thrown on the involvement or not of the vegetative nervous system in these diseases, and on the sufficiency or insufficiency of the hormones in the blood-stream that are activated by currents coming over this system.

In testing for vasomotor reflexes it is important to use a light stroke, the pressure approximating two ounces. The ordinary wooden tongue depressor, with its edges smoothed, is used to evoke the reflexes. Heavy stroking produces reactions that are in part due to trauma; likewise, stroking with the finger nail. By practice we can learn to employ a light stroke—about two ounces of pressure. (The pressure employed can be measured by stroking the balance pan of a spring letter-scales.)

SPEECH CORRECTION—A NEW MEDICAL STUDY AND A NEW EDUCATIONAL MOVEMENT.

By Walter B. Swift, A.B., S.B., M.D., Boston.

Clinical Assistant in Laryngology, Harvard Graduate School of Medicine; Assistant in Laryngological Department, Massachusetts General Hospital Speech Clinic.

Teaching and research in the field of speech correction seem to have started with Gützman of Berlin; at least, most of the men who have become primarily interested in speech disorder originally studied under him. Dr. E. W. Scripture of New York used to be one of the chief authorities in the psychological phases of speech defect. The late Makuen of Philadelphia was long a leader in the subject, and from him sprang Kenyon of Chicago, who now teaches in the Rush Medical School. Horn of San Francisco, a pupil of Gützman, and Guggenheim of St. Louis, also deserve mention.

The speech clinics in Boston have sprung from similar sources. To the inspiration and training afforded by Gützman, Scripture and Liepman, however, were added special and protracted study in psychology, dramatic art, neurology, neuropathology, psychiatry, and general medicine. The Boston clinics were founded only after this extensive but necessary training had been completed. The variety of interest and scope of research in the clinics must be regarded as a necessary result of the variety and scope of this preliminary training.

In 1912 the voice clinic was started, and in 1915 the speech clinic. After my appointment to the laryngological department of the Harvard Graduate School of Medicine, I was given an opporunity to offer graduate and undergraduate courses. The undergraduate course consisted of clinical lectures and demonstrations to whatever members of the fourth-year class were assigned to me from those electing the study of laryngology. Here I treated speech disorder as part of the general subject; for since the functions of the speech mechanism belong in the field of the laryngologist, their correction, education and development also belong there.

To accommodate the special needs and interests of students, the postgraduate courses in speech correction were grouped under four heads: medical, psychological, treatment, and educational. The medical courses consist in medical instruction, with special reference to speech. For example, it is shown how enlarged tonsils interfere with early speech development, how cleft palate makes speech indistinct, how paralysis of the tongue muscles makes certain utterances impossible. The courses dealing with the psychological aspect take up the mental functions related to speech, considering their origins and the relations of eye and ear registrations of psychological interpretive processes and mental collaboration. Under the treatment aspect, the courses take up the eradication of speech defects. The courses dealing with the educational aspect cover the relationship of speech disorder to the public schools. Here an endeavor is made to elicit the interest of teachers in the medical phases of speech. As the medical practitioner must delegate to nurses a great part of medical treatment, so the medical speech specialist must rely upon the teacher. The education aspect, therefore, applies to the training of the speech nurse.

So much for the work in speech improvement that is being done in the Harvard Medical School. The more immediate aims of the two speech clinics in Boston are: to carry on research and to teach students. But there are other aims, more important and far-reaching. These are, first, to show teachers how to correct speech disorder in the public schools; second, to found other speech clinics under other medical heads; third, to establish other teaching centers as affiliated branches of the original home clinics.

These Boston clinics are dominated by the research spirit. Every patient is fitted into some research problem. Every student is given an investigation. This accounts for the extraordinary productivity of the two clinics during the last few years. During last year, about one hundred and twenty papers were read by my assistants and myself, and during the year before that, one hundred and ten. Yet we have done nothing that others could not have done with the same training and opportunities. We have been working in unplowed wastes.

The results of our researches cannot, of course, be given here in detail. The psychological background of stuttering has been investigated, and a new treatment, based upon this investigation* has been devised and published, with remarkable results. We have found that the peculiar speech of cleft palate patients is not due entirely to the cleft palate, and that it is capable of correction. We have found that mental defectives are capable of speech improvement and of some resultant mental growth, when put through a long series of vocal drill which has been formulated.

The internal interests of these clinics—treatment, research, and teaching—are the usual ideals of any clinic. Their external activities and influences are more unusual. Last year one hundred and three teachers studied the methods and systems of the clinics, and this fall they will be putting them in practice in the schools. They will found departments of speech improvement in the public school systems of their various cities and will form classes for the correction of speech disorder under medical supervision. The physicians who have studied in these clinics have later established speech clinics of their own, affiliated with the home clinic, with aims of mutual aid. Several of my graduate students, after a year or two of connection with the home clinic, have founded teaching centers elsewhere. Considering these external activities, it would seem proper to call this whole undertaking a speech movement.

A word may be said regarding the clinical method. The patient's history is taken in the ordinary way and he is given a thorough examination—physical, mental, psychiatric, psychological, and educational—before the more exhaustive examination of the functions of his speech mechanism. Then treatment is outlined and he is drilled individually or in a class. At the same time he is fitted into an investigation, and a minutely detailed record of progress is put down as data for some future use. At times there have been twenty-five or thirty researches going on at once. Graduate students enter at any time of the year and are registered in the graduate medical department. The courses are concentrated and given more frequently in August, when five or ten courses are under way. During last August, one hundred and sixty hours' instruction were given.

A speech laboratory is to be the next outgrowth of the work of the Boston Speech Clinics. Some apparatus for this has already been obtained, and one of the hospitals where the speech clinic is housed has offered to build the laboratory according to instructions, as soon as funds are available. There will soon be available a foundation fund of $20,000 permanently given for this undertaking and to be used by me until my successor has been appointed. The research in both clinics has become so voluminous that it is necessary to separate it from the clinic activities and carry it on by itself in an especially equipped speech laboratory.

SUMMARY.

Research in the psychology and physiology of speech correction, though begun some years ago by Gützman in Berlin and carried forward by his pupils in various parts of America, offers a comparatively new and fruitful field to the medical specialist. The work being done in Boston, under the superintendence of Dr. Walter B. Swift, is of two sorts. First, there are the courses offered by him in the Harvard Graduate School of Medicine, covering the psychological, medical, educational, and treatment aspects of speech correction. These courses last one month and comprise twelve lectures, each followed by an hour of clinical demonstration. Second, there is the work of the two speech clinics conducted by Dr. Swift in Boston. This is of a more practical nature and embraces research in the pathology of speech, treatment of speech defects, and the training of public school teachers in methods of speech correction.

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* A Psychological Analysis of Stuttering. *Journal of Abnormal Psychology*, November, 1915.

All physicians who have studied in these courses have founded clinics elsewhere, and several of the graduate students have established teaching centers in other parts of the country. Funds are already available to the amount of $20,000 for the founding of a speech laboratory in which all the research hitherto done in the clinics will be carried on under more favorable conditions.

Book Reviews.

Obstetrics, Normal and Operative. By GEORGE PEASLEE SHEARS, B.S., M.D., Professor of Obstetrics and Attending Obstetrician at the New York Polyclinic Medical School and Hospital. 419 illustrations, 745 pages. Philadelphia and London: J. B. Lippincott Co.

It was with great interest the reviewer took up this book to review, because on the first page of the preface appears this sentence: "Most obstetric works contain too much irrelevant matter and too little about the practice of obstetrics." It is doubtful if one can question that statement, and, with that sentence in mind, the reviewer began reading the book.

Shears' book consists of four parts:

Part I. Normal pregnancy, labor and the normal puerperium.

Part II. Pathology of pregnancy and labor.

Part III. Obstetric surgery.

Part IV. Pathology of the puerperium.

The "traditional sections" on embryology and anatomy the author has omitted.

The book is individualistic throughout and the author writes clearly and much to the point.

As it is to the author "to the last degree exasperating to find a long bibliography of the Chamberlen family and no information on axis traction forceps," so also is it exasperating to the reviewer to find the archaic pictures of resuscitating the newborn babe reproduced in this new work. From that first sentence the reviewer quoted, little did he think those three timeworn illustrations of the prolapsed pregnant uterus (page 245), the pregnant uterus in the sac of the inguinal hernia (page 246) the diastasis of recti muscles with hernia of pregnant uterus (page 247), would appear in this work. While the reviewer is speaking of the illustrations perhaps a few other remarks may not be amiss. Why, on page 66, should palpation of the abdomen be pictured with the physician wearing gloves, while, on page 335, palpation of the hydrocephalic head in utero calls for no gloves. There are other similar inconsistencies in the author's illustrations which are so evident that there is no need to remark on them.

As for the text, the author has put his operative technic and methods in a very clear, concise style. In the finer points of treatment and technic no two obstetricians will always agree, and it is not the reviewer's aim to point out these minor differences, but there are certain points of criticism that should be mentioned. In placenta praevia (page 479) the author takes a typical case and says the first thing to do is to rupture the membranes. The reviewer cannot admit that there is any such thing as a typical placenta praevia—there are too many variable factors always present: the parity, the cervix, its condition, position of the placenta, condition of mother and size of fetus—all of these are variable and, therefore, there can be no typical praevia, and so the first thing is not always to rupture the membranes. The author's advice of a slow delivery by version is as unsound as his advice to hurry delivery by the use of pituitrin is unsound.

The author's chapters on contracted pelvis, induction of labor, obstetric operations are all excellent. In the treatment of eclampsia, the author takes the stand that "operative delivery soon after the first convulsion carries a far better prognosis than this same measure performed as a last resort," and he is not impartial to a Caesarean section being done.

It has been a pleasure to study this book, although the reviewer holds many divergent views. The author's enthusiasm and sincerity make the book stand for advancement in obstetrics, and for that reason it is a welcome addition to our libraries.

The Treatment of War Wounds. By W. W. KEEN, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Illustrated. Philadelphia and London: W. B. Saunders Company. 1917.

There is nothing finer in the world than the existence of a spirit and a will that neither years nor circumstances can thwart or conquer. Dr. Keen has taught students and doctors for generations; and now chafing at the bit because he cannot fight in France, he turns his compelling spirit to a timely textbook of the war—"The Treatment of War Wounds." His name on the cover should make every surgeon open the little volume, and opening it once, means consulting it frequently.

It is by far the best, most complete and, at the same time, most condensed statement of the subject that we have seen. It is also the most recent. Letters from surgeons abroad increase its interest for those of us who, like Dr. Keen, stay at home; though few of us have his reasons for staying.

It is to be hoped that every surgeon in America will read this book carefully, for both the subject and the author deserve our best attention.

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THURSDAY, DECEMBER 6, 1917

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CARBON DIOXID AND VENTILATION.

One of the important problems occurring in the construction of military cantonments on a large scale is the one concerned with ventilation and with the allotment of adequate air space to each individual. Because of the cost of space and material, no extravagance in space or in ventilating apparatus can be permitted, but all provisions must be at a minimum. Thus far no rational standardization of the minimum amount of air purity that each individual within the confines of an enclosure must have, has been determined. Yet arbitrary requirements in this respect have been laid out and are in use in many public buildings. Besides, the index of air purity and adequate ventilation has been determined in terms of carbon dioxid contamination of the air. Recent investigation has, however, established the fact that this index is not reliable, and the requirements for carbon dioxid freedom too exacting. Hall (University of London) pointed out that there were no deleterious effects experienced when the carbon dioxid contamination of the air was increased from the ordinarily permissible 6 to 8 parts in 10,000, even to 300 parts. The concentration of the carbon dioxid in the blood did not show any increase under this apparently enormous contamination. Carbon dioxid becomes an index only of the amount of respiration the air in a particular place has undergone. The amount suggests perhaps more positively than anything else the amount of organic matter present in the air which has been expired from the lungs of those present. And if the organic constituents of the air can be taken care of, the carbon dioxid is of no moment in providing for ventilation. In any event, the problem of heating and ventilation is not so much a matter of maintaining the chemical purity of the air, nor even of providing for the organic contaminations, but rather a problem concerning itself with seeing that the physical effect upon skin and mucous membranes is not one to diminish their normal physiologic action. In other words, ventilation and heating must concern themselves chiefly with the humidity or dryness of the air, as well as its temperature, and not so much with its chemical purity. When the humidity of an enclosure can be maintained between 40 and 45, the temperature between 60 and 65° F., and the air velocity between 1 and 3 feet per second, the carbon dioxid and organic contamination can be left to take care of itself.

In this connection it must be remembered, in spite of notions to the contrary, that the problem of adequate ventilation, that is, the interchange of respired air with fresh air in enclosures, is a problem of the warmer seasons of the year and not the colder ones. In the winter there is the problem of the waste of fuel from the unwarranted loss of heat in trying to overventilate, if the standard of ventilation is the carbon dioxid contamination. In the warmer seasons of the year the temperature inside and outside is very likely to be the same, and consequently there will be no movement or interchange of air necessary for ventilation, even when there is an opportunity for a maximum amount of change to take place. In the winter months, on the other hand, even with the minimum provisions for natural ventilation, the marked differences in temperature between inside and outside air encourages rapid air currents, maximum interchange and adequate ventilation. In order, therefore, to maintain proper ventilation in kind and in quantity during all seasons, due regard must be accorded these physical facts. Natural ventilation cannot be trusted to fulfill all these requirements evenly throughout the year. American ventilating engineers are resorting more and more to mechanical systems of ventilation, with the view both of giving the most adequate ventilation and of reducing, as well, the cost of fuel for heating purposes. The constant introduction of cold air into heated confines increases the cost of fuel enormously. Taking into consideration the harmlessness of carbon dioxid contamination, and in order to maintain proper temperature at a minimum cost, modern ventilating engineers are making provisions for the recirculation of the warm respired air, after washing to remove some of the organic additions. Only a small amount of fresh cool air is introduced at each washing. These ventilating systems can work with as little as 10% of fresh cool air, and without deleterious effect upon the health of the occupants. Outside of fuel economy, the greatest advantage of this system of ventilation is that humidity can be maintained at any required degree. Ventilation on a large scale in modern times is becoming more and more a science,—a mechanical science. Natural ventilation is being discarded as inadequate and wasteful of fuel, and as an empiricism having no place at the present time.

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VACCINATION AND TETANUS.

The elements of society opposed to vaccination against smallpox, besides opposing this procedure on the ground that it is inefficacious to prevent the development of this disease, oppose it on the ground that it is the means of introducing disease into the body, particularly syphilis and tetanus. The claim of inefficacy can easily be disposed of by calling attention to the fact that since the introduction of this means of prevention smallpox has almost entirely disappeared from civilized communities. The question of the introduction of syphilis has no force at present, because human vaccine virus is no longer used, and, so far as is known, syphilis is transmitted only from man to man and the higher apes. But when we come to the consideration of tetanus, it must be admitted that unless this factor can be disproved it is a serious arraignment of vaccination. With this point in view, an exhaustive study of vaccination tetanus was made by Anderson (Hygienic Laboratory Reprint No. 289). In the first place, it was found that during a period of about 10 years and the sale of over 40 million vaccine tubes, not more than 41 cases of tetanus had been reported. Even if the vaccine origin of these cases were authenticated, the percentage of infection would be almost infinitesimal. Examination of vaccines from the same stock that apparently caused infection failed to reveal the presence of any tetanus bacilli. Moreover, it was found on investigation that there were no other cases of infection with tetanus, although the same lot of vaccine had been used. In the same period, in over half a million vaccinations in the army, under strict supervision, not one case of tetanus developed. Experiments were undertaken to infect susceptible animals—monkeys and guinea pigs—with vaccinia and with tetanus at the same time, but while the vaccination "took," it was impossible to infect them with tetanus. This seems to prove that even in infected vaccine heavily laden with tetanus, there was little likelihood of the development of tetanus.

An intensive study of the data surrounding the 41 cases of tetanus revealed some interesting features. The average incubation period, reckoning from the time of vaccination, was 22 days and the mortality was 70%. And yet it is known that in tetanus from other causes, where the incubation is less than 10 days, the mortality is only about 61%—a very high mortality at best. In cases where the incubation period was more than 10 days, Anders and Morgan report the mortality as not over 41%. It would seem, then, that if the period of incubation in vaccine tetanus was 22 days, a mortality of over 70% was inordinately high, or else that the incubation period of this post-vaccine tetanus was in fact less than 22 days—perhaps even less than 10 days. In other words, infection did not have origin 22 days preceding the development of tetanus, that is, at the time of vaccination, and vaccination cannot justly be credited with the guilt for the development of this disease. It is more logical to suppose that this post-vaccination tetanus occurred as any other post-surgical tetanus,—from the introduction of tetanus bacilli through careless surgical methods with regard to the care of the vaccination wound. Indeed, in some of the cases investigated this was clearly proven. The removal of scabs, the presence of dirty vaccination shields and careless handling can all infect a vaccination wound. The removal of the crust or scab from the vaccination can allow infection with tetanus germs or spores, and the re-formation of the scab can produce the anaerobic conditions necessary for the development of tetanus bacilli. The question of the prevention of tetanus infection or other infections with relation to vaccination depends upon the strict enforcement of surgical cleanliness at all stages of the vaccinia. The absence of any case in the army, where such discipline, as well as other discipline, can be enforced, points to the direction in which more care must be exercised where large numbers are vaccinated.

THE LAST ILLNESS OF GENERAL WASHINGTON.

The following interesting account of General Washington's last illness is from the "Library of Practical Medicine" for 1861. This volume was published by the Massachusetts Medical Society, for the Fellows. The title of the communication is: "Memoir of the Last Sickness of General Washington, and Its Treatment by the Attendant Physicians."

General Washington was in his 68th year, and had apparently been in excellent health up to the time of his brief and fatal illness. It has been popularly supposed that this last illness was due to "croup" or "quinsy." In the following account acute laryngitis is given as the cause of General Washington's death. The account was derived from Colonel Lear, within 24 hours of General Washington's decease, with an attestation as to its correctness, by Washington's friend and physician, Dr. Craik.

> "On the 12th of December, 1799, General Washington was abroad on his farms, on horseback from 10 o'clock a.m. to 3 p.m. Soon after he went out the weather became very bad, rain, hail, and snow falling alternately, with a cold wind. To the watchful eyes of his family there was no appearance of disease, though they looked for them, until the next day; he then complained of a sore throat. He had a hoarseness, which increased in the evening, but he made light of it.
>
> "The 13th of December he was kept from riding out by a snow storm. When in the evening Colonel Lear proposed that he should take something to remove his cold, he answered, 'No, you know I never take anything for a cold; let it go as it came.'
>
> "It was this night that his sickness arrested his attention. He was taken with an ague between 2 and 3 o'clock on Saturday morning, the 14th. He awoke Mrs. Washington, and told her that he was very unwell. He then had great difficulty in breathing, speaking, and swallowing. These symptoms continued till his death, which took place between ten and eleven o'clock the following night. It was also difficult for him to speak; it was breathing, however, which caused him the most distress. The efforts which he was compelled to make in breathing were extremely distressing, and occasioned great restlessness, the more because his strong efforts were insufficient to supply his lungs with as much air as his system had need of. His mind remained unclouded to the last. It is needless to say that he showed to the last those strong and great characteristics of mind and heart by which his whole life had been marked."

As far as treatment goes, we learn that General Washington was bled and blistered, and calomel and antimony were administered internally. From the symptoms described in the account of Washington's last illness it seems possible that he was the victim of a pneumonia of sudden and overwhelming intensity. The possibility of a pneumonia terminating so suddenly is borne out by modern clinical experience. This would in no way preclude the symptoms of an acute laryngeal trouble.

It is of interest to recall that General Washington's fatal illness occurred when Laennec, the originator of stethoscopy, was a youth of 18 years. Twenty years after General Washington's death, Laennec's great discovery was given to the world.

MEDICAL NOTES.

An American Substitute for Salvarsan.—Announcement has been made unofficially in the daily press of the preparation of a substance to take the place of salvarsan. It is called A-189, and is said to be less dangerous to use than salvarsan and much less expensive. A single dose costs about five cents. The formula is perfected and the substance is ready for immediate manufacture. Announcement was also made of the effectiveness in cases of tetanus of an injection intravenously of a four per cent. solution of Epsom salts.

Communicable Diseases in Portland, Me.—The report for the year 1916 of the Board of Health of Portland, Me., shows that in a population of over 60,000, there were 113 cases of diphtheria, 57 cases of scarlet fever, 115 cases of typhoid fever, and 323 cases of measles.

Appointment to Chair of Tuberculosis.—Announcement is made that Sir Robert W. Philip has been unanimously elected by the Edinburgh University Court to the Chair of Tuberculosis, which has just been created in the University. This is the first professorship of tuberculosis to be founded in the United Kingdom.

Dr. E. O. Otis of Tufts Medical School holds the only professorship of tuberculosis in this country. His title is "professor of pulmonary disease and climatology."

WAR NOTES.

Health of Soldiers at Cantonments.—During the week ending November 16, there were 96 deaths at the National Guard and National Army camps. Pneumonia was responsible for 61 of the deaths. The rate in the National Guard is 42.6 per thousand, and in the National Army 28.5 per thousand. The highest rate is prevalent among Southern troops. Camp Travis at Fort Sam Houston, where measles is epidemic, had a rate of 87.9 per thousand. Camp Meade, at Annapolis Junction, Maryland, had the lowest rate, 9.1.

Dr. Blake's Hospital, Paris.—The hospital which was established by Dr. Joseph A. Blake in Paris, and which he and a staff of doctors have operated ever since the beginning of the war, will become American Red Cross Military Hospital No. 2, and will be for the use of American soldiers. Financial support has been arranged for under an agreement entered into by Dr. Blake, the Red Cross, the Service de Santé, and the United States Army.

Health of American Troops in France.—A report of health of American troops in France, issued by Surgeon-General Gorgas, covers the week ending Nov. 9, and shows the incidence rate of cases of principal diseases per thousand men as follows:

Pneumonia, 16.6; dysentery, 2.0; malaria, 1.0; venereal diseases, 181.5; typhoid, 0; paratyphoid, 0; measles, 21.7; meningitis, 1.0; scarlet fever, 1.9.

The non-effective rate per thousand for Nov. 12—which is the number of men per thousand who on the day reported were excused from duty for any indisposition whatever—was 31.6.

Total deaths for the week ending Nov. 9 were 8, as follows:

Pneumonia, 3; heart disease, 1; wounds received in action, 3; accidental gunshot wound, 1.

Killed and Wounded.—Report is received from General Pershing of the American expeditionary forces that First Lieut. Orlando Gochnaur, of the Medical Officers' Reserve Corps, attached to British forces, was killed in action on November 6. First Lieut. Alexander J. Gillis, of the Medical Officers' Reserve Corps, attached to British forces, was slightly wounded in action on the same date. Assistant Surgeon Dudley W. Queen, attached to the destroyer *Cassin*, which was damaged recently by a German torpedo, died on Nov. 20, at an Irish seaport. Dr. Queen was a native of Texas.

War Relief Funds.—On Dec. 1 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$301,032.63
Armenian-Syrian Fund	261,972.80
Surgical Dressings Fund	139,763.09
British Imperial Fund	114,869.04
Italian Fund	56,436.94
LaFayette Fund	33,224.03
War Dogs' Fund	2,084.28

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending December 1, 1917, the number of deaths reported was 216, against 232 last year, with a rate of 14.58, against 15.90 last year. There were 31 deaths under one year of age, against 32 last year.

The number of cases of principal reportable diseases were: diphtheria, 111; scarlet fever, 28; measles, 68; whooping cough, 41; typhoid fever, 2; tuberculosis, 77.

Included in the above were the following cases of non-residents: diphtheria, 11; scarlet fever, 4; tuberculosis, 2.

Total deaths from these diseases were: diphtheria, 4; scarlet fever, 1; measles, 3; whooping cough, 1; tuberculosis, 28.

Included in the above were the following non-residents: diphtheria, 2; tuberculosis, 3.

Annual Meeting of Tuberculosis Society—The Boston Association for the Relief and Control of Tuberculosis held its annual meeting at the Twentieth Century Club, Boston. Dr. Cleveland Floyd, director of the out-patient clinic of the Boston Consumptives' Hospital, told of the handicap under which his clinic had worked because of lack of hospital facilities.

The below-par child, need of intensive education, and lack of an out-patient clinic, with modern equipment, where rapid diagnoses of cases could be made, he considered the vital factors in the situation.

Dr. John F. O'Brien of Charlestown outlined the history of that institution, and paid a high tribute to Edward F. McSweeney and Dr. James J. Minot. He also told of the intention to establish night camps for patients who have partly recovered and returned to work.

Dr. Edwin A. Locke, chief of the visiting medical staff of the institution, spoke of the need for employment as a part of the program of treatment to counteract the danger of making a loafer of the patient.

Mrs. Anna M. Staebler, secretary of the committee on health in industry, told of the work industrial nurses are doing for employees. The sanitary condition of workshops, she said, is often much better than that of homes.

Dr. Arthur K. Stone, president of the Association, in presenting his annual report, said that the deaths from tuberculosis in the State were 4466 in 1916, as compared with 4194 in 1915; in Boston the figures were 1166 in 1916 and 1029 in 1915. Judging by the first nine months, the 1917 figures would be about the same as those of last year. He ascribed the causes of this apparent increase to be better reporting of cases, and greater boldness of doctors in putting down the real diagnosis.

Faulkner Hospital.—The Faulkner Hospital, Jamaica Plain, reports an increase of 786 in the number of hospital days for the year ending May 1, 1917, with a total of 614 patients. The new maternity ward has been opened, and it is planned to increase the number of nurses from twenty-six to thirty-two.

Peter Bent Brigham Hospital.—The recently published report of the Peter Bent Brigham Hospital, which covers the year 1916, states that 3712 patients were admitted to the wards, 9810 new patients were treated in the Out-Door Department; the X-ray Department made 5504 examinations, and the serological laboratory made 3530 examinations. At the request of the United States Government, the Hospital will make a study of the effects of caffeine on the human body. Extended studies in asthmatic conditions have been made possible by a gift of money for that purpose. Similar gifts would be appreciated for study of cases of heart disease, diabetes, and Bright's disease.

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The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

DISTRICT CORRESPONDENTS.

Berkshire, A. P. Merrill, M.D., Pittsfield.
Bristol North, Arthur R. Crandell, M.D., Taunton.
Bristol South, Edwin D. Gardner, M.D., New Bedford.
Essex North, T. N. Stone, M.D., Haverhill.
Essex South, H. P. Bennett, M.D., Lynn.
Hampden, Laurence D. Chapin, M.D., Springfield.
Hampshire, E. E. Thomas, M.D., Northampton.
Middlesex South, William C. Hanson, M.D., Belmont.

Essex South District Medical Society.—Revised list of physicians in Government service Nov. 1, 1917:

Lynn—U. S. Army, Medical Reserve Corps, N. P. Breed, H. L. Davis, E. M. Dolloff, L. M. Hassett, C. L. M. Judkins, W. V. Kane, G. H. Kirkpatrick, W. F. Lemaire, L. H. Limauro, E. A. Merrill, C. H. Merrill, O. C. Spencer, J. W. Trask; Canadian Army, W. G. Shepard.

Salem—U. S. Army, DeW. S. Clark, E. A. Rushford.

Saugus—U. S. Army, G. C. Parcher.

Danvers—U. S. Army, A. P. Chronquest.

Beverly, U. S. Army, P. P. Johnson, H. E. Sears, W. G. Stickney, T. H. Odeneal

Lynn—U. S. Navy, Medical Corps, J. R. White; Medical Reserve Corps, G. W. Eastman, R. W. Mathes.

Gloucester—U. S. Army, Reserve Corps, S. W. Mooring.

Salem—U. S. Navy, Med. Reserve Corps, L. R. Chisholm.

Hamilton—U. S. Army Reserve Corps, C. H. Davis.

H. P. Bennett, *Secretary.*

Dr. P. P. Johnson has been advanced from the rank of Captain to that of Major, in the M. R. C., and has been transferred from Fort Benjamin Harrison to Fort Oglethorpe, Ga., for temporary duty.

The regular meeting of the Essex South District Medical Society was held at Beverly, on the evening of Nov. 22. Major Lund of Boston spoke on "War Surgery," and "The Need of the Medical Reserve Corps for More Volunteers."

The Anti-Tuberculosis Society of Beverly held a Health Exhibit at City Hall, from Nov. 15 to Nov. 18. The following persons spoke: Miss Besom, of the State Department of Health, on "Infant Welfare"; Miss Wood, of the Massachusetts Society for the Prevention of Cruelty to Children, on "Feeble-Mindedness"; Mrs. Miller, of Filene's Service Department, on "Economical Clothing in War Time"; Mr. Alton B. Briggs, of the Boston Fruit and Produce Exchange, and a member of Mr. Hoover's committee, on "The Food Situation"; Dr. John D. Adams, of Boston, on "Tuberculosis at Home and in Labrador"; Mr. Willis Chandler, Secretary of the Rhode Island Anti-Tuberculosis Association, on the "Red Cross Seal Campaign."

R. E. Stone, *Reporter.*

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SOCIETY NOTICES.

Norfolk South District Medical Society. Meeting for Medical Improvement at United States Hotel, Boston, Thursday, Dec. 6, 1917, at 11.30 a.m.

Reader: Dr. Frank A. Pemberton, of Boston.

Subject: "Hemorrhage from the Uterus in the Non-Pregnant Woman."

For Dr. Charles O. Day, of Hingham

F. H. Merriam, M.D., *Secretary.*

The Harvey Society. The fourth lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, Dec. 8, 1917, at 8.30 p.m., by Prof. A. S. Warthin, of the University of Michigan.

Subject, "The New Pathology of Syphilis."

F. H. Pike, M.D., *Secretary.*

The Boston Medical and Surgical Journal

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HODGKIN'S DISEASE: A REPORT ON THE CASES OBSERVED AT THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL FROM APRIL, 1913, TO JULY, 1916, WITH SPECIAL REFERENCE TO TREATMENT WITH RADIUM AND THE X-RAY.*

By Channing C. Simmons, M.D., Boston,

and

George Benet, M.D., Boston.

[From the Cancer Commission of Harvard University.]

The following is a report on the cases of Hodgkin's disease and allied tumors of the lymph glands treated at the Collis P. Huntington Hospital from its opening in April, 1913, to July, 1916, a period of a little over three years. It was intended to report only the cases of Hodgkin's disease, but in studying the cases it was found on microscopic examination of the specimens, that three clinically Hodgkin's disease were lymphosarcoma. These three cases have been grouped separately, and are considered chiefly in regard to treatment.

The report represents the work of the whole staff of the hospital, and the data have only been collected and analyzed by the authors. The radiotherapy has been under the charge of Dr. William Duane. Especial mention should be made of pathological and experimental work done by Dr. E. E. Tyzzer, and clinical studies by Dr. Thomas Ordway.

Besides analyzing the cases, our object has been to try to determine the value of various forms of treatment, radium in particular.

During this three-year period, 31 cases, clinically diagnosed as Hodgkin's disease, applied for treatment. Three of these proved, on microscopic examination of the glands, to be lymphosarcoma. Of the remaining 28, specimens were available for study in 20, one of which proved to be metastatic carcinoma, while reports of the glands removed in other hospitals were obtained in 3.

In 5 cases no specimen was available for study, and the diagnosis is purely clinical. Twenty of the cases are dead, 7 coming to autopsy, and 10 are under treatment at the present time. These for the most part are cases that have come under observation since January, 1916.

For the purpose of this report the 19 cases of Hodgkin's disease, proved by personal examination of the microscopic specimen, are alone considered. The three cases in which we have a report on glands removed at other hospitals are excluded, as the description of the specimen was too brief. The three cases of lymphosarcoma are considered separately.

Much has been written in recent years on Hodgkin's disease and allied affections of the lymph nodes, and no attempt will be made here to review the entire literature. Some years ago it was considered a form of tuberculosis by many (Steenberg[1]), but this has been pretty generally disproved. At present it is considered to be either the result of an infection, or as a tumor growth. Cunningham[2] says the evidence of its being an infection is:

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* Submitted to the Cancer Commission for publication January 1, 1917.

1. The histology of the glands suggests an infection.

2. The injection of emulsions of glands has caused lymphatic enlargement.

3. The fever suggests an infectious process.

4. There is a slight leucocytosis.

5. There is an exudate where serous membranes are involved.

Bunting and Yates,[3, 4, 5] who have written extensively on the subject in the past few years, believe the disease infectious, and have isolated a diphtheroid bacillus with which they claim to have caused Hodgkin's disease in a monkey. This bacillus is evidently the same found by Negri and Miermet,[6] and since then by many others, Rosenow[7] finding it in 38 out of 40 cases. Practically every one writing since the article by Bunting and Yates appeared has been able to demonstrate this bacillus in some of their cases. Rosenow[8] has done special work on the method of obtaining cultures from lymph glands, ovaries and other tissues, and Bloomfield[9] has shown bacteria of many different varieties in many so-called normal lymph glands. In their last article Yates and Bunting[10] say they have no final proof of the etiological relation of the diphtheroid bacillus to the disease. They[11] also claim that Hodgkin's disease, lymphatic leukemia, mycosis fungoides, Banti's disease and lymphoma are different forms of the same disease, but this view is not generally accepted, and most observers consider Hodgkin's disease a distinct entity with a definite pathology. Others, as Warfield and Kristjanson,[12] have been able to study glands removed at different times from a given case, which in the first instance showed lymphosarcoma, and later typical Hodgkin's disease. The blood at the time the second specimen was removed was typical of lymphatic leukemia. We have seen the blood in cases of Hodgkin's disease when, for a single day, the percentages of polymorphonuclear neutrophiles and lymphocytes have been reversed.

The adherents of the tumor theory say that Hodgkin's disease, in its later stages at least, acts as a malignant tumor forming metastases in organs where there is normally no lymph adenoid tissue. Yamasaki[13] and Karsner[14] recognize this but consider the disease a granuloma which may, in its later stages, take on the form of a pleomorphic sarcoma.

In this series of cases the diphtheroid bacillus was found by Ordway in two out of the three cases in which it was sought, and we still have it in pure culture from Case 7.

Case 2. Cultures made from a gland removed from below the angle of the jaw. Blood agar: contaminated. Agar agar: scanty growth of diphtheroid bacilli. Special media: few colonies of diphtheroid bacilli. After the third transplant the bacilli failed to grow.

Case 7. Culture made from an emulsion of a gland removed from the axilla. Slight growth of diphtheroid bacilli on dextrose agar, dextrose bouillon, plain bouillon, agar agar, and blood agar. Profuse growth on special media showing club forms, with parallel order and suggestion of polar granules. Bacilli still growing in pure culture after many transplants (21 months later).

Case 31. Cultures made from gland removed from over the right scapula in several media. No growth in any.

The following experiments were made by Dr. E. E. Tyzzer: Monkeys were inoculated with emulsions of glands removed from Cases 1, 2, and 4 made by grinding the gland tissue in a mortar with salt solution. Injections were made into the axial lymph nodes, and pieces of tissue were also implanted subcutaneously in several places. The monkey inoculated from Case 1 died three months later of tuberculosis. An autopsy showed tuberculosis of the various organs, but no other lymphatic change. The monkey inoculated with a portion of the gland from Case 2 was well at the end of 10 months. Tuberculin reaction was negative. The monkey inoculated from Case 4 received some of the gland emulsion into the peritoneal cavity. He was well two months later, at which time he was used for another experiment. Guinea pigs were also inoculated in the peritoneal cavity with an emulsion of a gland removed from Cases 1, 4, and 7. At the end of several months they appeared in normal health and were rearing young. In Case 5 at the time of removal of a gland for diagnosis, a small piece was implanted under the skin of the patient. This was palpable for several days but diminished in size and had entirely disappeared ten days later. (Case reported by Tyzzer[15].)

ETIOLOGY.

Sex. In the series of 19 cases of Hodgkin's disease, proved by microscopic examination of glands removed, there were 6 females and 13 males. Zeigler,[16] in his monograph reporting 220 cases, had 71 females and 149 males.

Ages. The ages by decades were as follows:

10 to 20, 6 cases
20 to 30, 8 cases
30 to 40, 3 cases
40 to 50, 2 cases

Bunting[17] states that most males are under 33 and females over 34 at the time of appearance of the first symptoms. Our figures are:

Females over 33, 2; under 33, 4.
Males . . over 33, 3; under 33, 10.

The average ages were: females 26.5 years, males 26.7 years. The disease is essentially one of young adults.

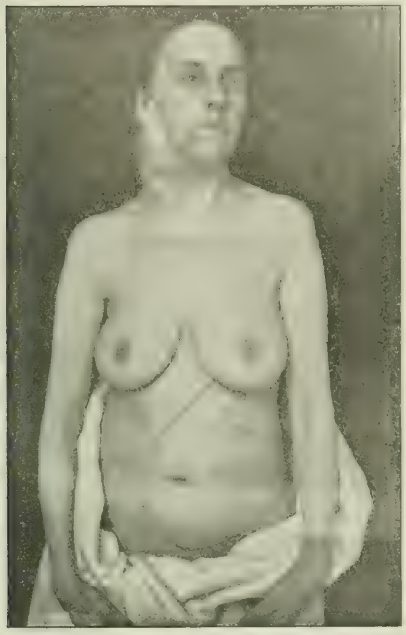

Fig. 1.—Case 10. Hodgkin's disease. (No specimen of the glands available for study.) Female, 34 years old. Disease of 30 months' duration. Masses of enlarged glands in the right side of the neck, and enlargement of the spleen. (See Fig. 2.)

Glands Involved. The glands involved first and for which the patient sought treatment were as follows: neck 16 cases, chest (cough) 2 cases, groin 1 case. In every case the glands were enlarged, when the patient sought treatment, in more than one region. The mode of onset was often suggestive of an infectious origin, particularly when the glands of the neck were first noticed. The patients in 4 cases (Cases 4, 14, 24, 28) stated that the masses appeared in the neck shortly following a pharyngeal infection—in three cases "grippe" and in the fourth an acute tonsillitis with abscess. The history of Case 14 is typical and suggestive.

Case 14. Male, 44 years old. Had a sudden attack of grippe two months ago with malaise, fever, and swollen glands in the neck. These glands persisted after his recovery from the acute infection. A gland removed two months after the onset of the disease showed typical Hodgkin's disease on microscopic examination.

Cases 2 and 5 were "subject to colds," and in the latter the glands in the neck appeared shortly after an attack of erysipelas. In Case 26 the glands appeared during an attack of bronchitis. In the cases where the bronchial glands were first affected no possible etiological factor was noted. We have no cases primary in the abdominal glands, and the spleen was noted as enlarged in only four cases (Cases 4, 12, 14, 17).

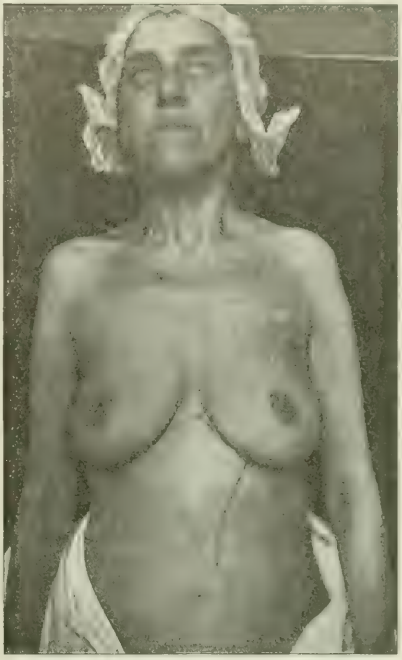

Fig. 2.—Case 10. Four weeks after beginning radium treatment. The masses of glands in the neck have nearly disappeared, and the spleen has diminished in size. The general condition, however, has failed appreciably. Death six months later. (See Fig. 1.)

Duration. The average duration of the disease before applying to the Huntington Hospital for treatment was 18 months, and of the three cases classed as lymphosarcoma, 30 months. The total duration of the disease from the first symptom till death in the 14 cases in which the outcome has been fatal is as follows:

Less than 1 year	6 cases
1 to 2 years....	4 cases
2 to 3 years....	2 cases
5 years..........	1 case
8 years..........	1 case

The remaining five cases are under treatment at the present time. Most of our cases, therefore, are what may be called the acute type of the disease, a rather larger proportion than usual. One thing has been very striking—the sudden decline and death in a few weeks of patients who have left the hospital improved both as regards the glands and the general condition, and very much encouraged.

Types. Cunningham speaks of the symptomatic and latent type of Hodgkin's disease, and divides the symptomatic into an acute and a chronic form. The division is purely arbitrary, but cases do fall in these groups. The acute cases are those having an acute onset with fever and other symptoms of infection, which run a rapid course to a fatal termination in 2 or 3 months. In the chronic type the symptoms are the same but with periods of remission, and the disease runs a longer course but eventually ends in death. In the latent cases the glands exist for years with little variation in size and with few subjective symptoms, but the cases progress slowly and death finally ensues.

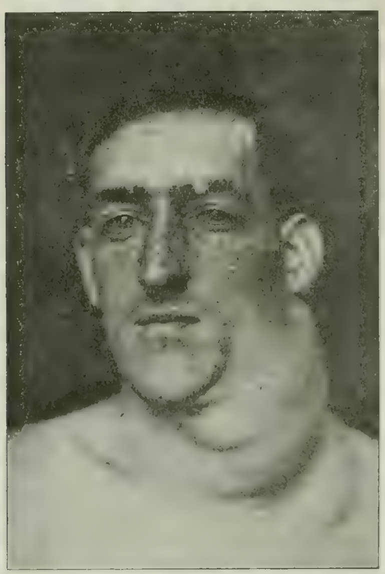

FIG. 3. Case 22. Male, 27 years old. Tumor of neck for past six years. Photograph before treatment, taken in December, 1915.

Symptoms. The course of the disease, with or without treatment, is essentially chronic and characterized by exacerbations with increase in the size of the glands, fever, loss of weight, etc. These are followed by remissions where the glands diminish in size and, the patients often say, disappear, but we have always been able to demonstrate them on careful palpation. Even when the glands of the neck, for example, diminished in size and the general condition improved, there was often a slowly progressive enlargement of the mediastinal glands, and these latter did not seem to vary in size as did those of the neck, although this is very difficult to determine with any degree of accuracy.

The chief subjective symptoms were general weakness and loss of weight. In the more acute cases there was fever of a remittent type. Pain was present at some time during the course of the disease in many instances, but was probably always due to pressure of the glands on adjacent nerves.

CASE 1. Severe pain in the arm, probably due to pressure on the brachial plexus.

CASE 5. Severe neuralgic pain in the fifth nerve.

CASE 8. Symptoms of a transverse myelitis when first seen, which gradually cleared up.

CASE 28. Right facial paralysis.

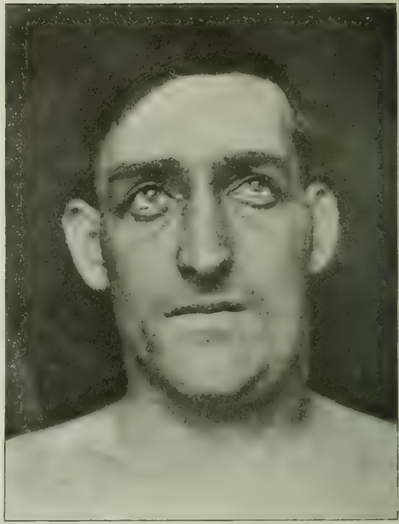

FIG. 4.—Case. 22 (see Fig. 3). Photograph taken in November, 1916, showing reduction in size of mass of glands in the neck after radium treatment. There is a diffuse mass of tissue adherent to the zygoma that appeared in October, 1916, and many small palpable glands still remain.

There were many other symptoms due to pressure from glands which developed during the course of the disease. Two cases had exophthalmos (Cases 14, 28). Other cases had ascites, pleural effusion, dyspnea, etc.

The glands varied very much in size, both with and without treatment, and were present at the first examination in more than one region in every case. Three patients came in once and were given appointments for radium treatment, but by the day set the glands had so diminished in size they failed to keep them. They reported later when the glands became large again, and two have since died. Weakness, loss of weight and anemia were present in a greater or less degree in every case, although in the remissions or as the result of treatment it improved. Progressive anemia, however, was the rule.

The Wassermann test was made in 16 cases. It was positive in 3, doubtful in 1, and negative in the others. It apparently signified nothing in regard to the disease.

Temperature. The temperature was elevated at some time during their stay in the hospital in 11 cases. It was normal in 4, and rather subnormal in 4. The fact that it was not elevated means, in most instances, nothing, as the observations did not extend over a long enough period. On the other hand, Case 1 was under observation six months and died in the hospital. She ran a subnormal temperature the entire time. Several of the other cases with normal temperatures were under observation two or three months. The character of the temperature was its extreme irregularity.

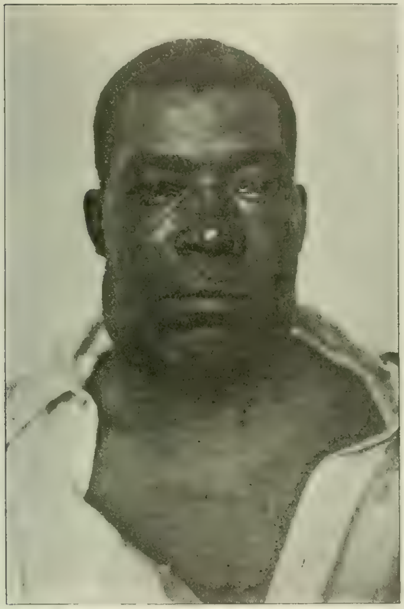

Fig. 5.—Case 14. Hodgkin's disease. Masses of glands in both sides of the neck. (See Figs. 6 and 7.)

Spleen. The spleen was noted as being enlarged, clinically, in 3 cases. In the 6 cases coming to autopsy it was enlarged in 3, in one of which it was not noted clinically, and slightly enlarged in one other. In three of the autopsies the organ contained nodules, although in one of these it was normal in size. In the case in which the spleen was slightly enlarged it appeared normal on section.

Skin. Skin lesions have been mentioned as occurring. Case 9 presented many keratoses. This patient received Fowler's solution, and the arsenic may have had some relation to the eruption. It was present a year after the discontinuance of the drug, however.

Blood. Blood examinations were made on 17 of the 19 cases. There was one observation on 5 cases, two on 8, three on 2, and nine on 1. Bunting and Yates[17] state that the blood in Hodgkin's disease is quite typical. According to them, there is a relative and an absolute increase in the transitional forms, and an increase in the basophiles, while the white count in the early stages is less than 10,000. Later there is a slight increase in the eosinophiles and the white count is over 10,000. The lymphocytes are always slightly increased. In the very late stages there is an increase in the polymorphonuclear neutrophiles.

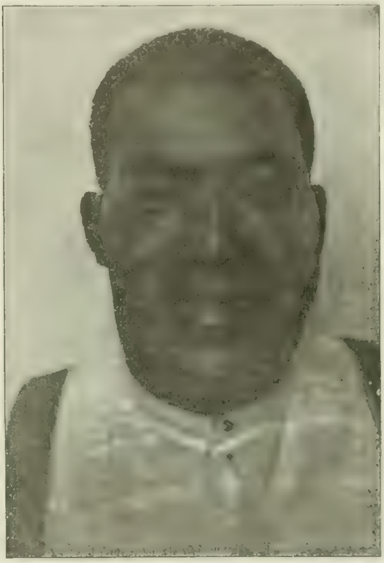

Fig. 6.—Case 14 two weeks after the first treatment with radium, showing marked diminution in size of the glands in the neck.

In Warfield and Kristjanson's case, previously mentioned, a gland removed showed lymphosarcoma, but two months later a second gland removed showed typical Hodgkin's disease, while the blood at this time was characteristic of lymphatic leukemia. If corroborated by others, this would lend strength to Bunting's theory that all diseases of the lymphatic system are different manifestations of the same condition. On the other hand, we have known a temporary reversal of the proportions of the lymphocytes and polymorphonuclear neutrophiles to occur.

We have not a sufficient number of observations in any one case to draw conclusions in regard to the blood changes. As a rule, the blood showed a slight anemia. Occasionally with treatment the anemia diminished, but it was usually slowly progressive. The white count was in most instances somewhat increased, but was never that of a leukemia, 35,000 being the highest recorded, but 90% of these were neutrophiles. The polymorphonuclear neutrophiles were increased in most instances, that is, over 75%. In Case 1 there were 90% one year before death, and in Case 6 86% nine months before death. In Case 31 there has been a fairly constant rise in the past year (nine observations).

The lymphocytes were usually somewhat increased, but the counts were not made in reference to the effects of radium on these cells. Dr. Forbes is studying this at present. In Case 23 differential counts made one and three weeks after treatment with radium of 1023 millicurie hours, showed 40% and 70% lymphocytes respectively. Case 31 received considerable radium treatment and counts were made about once a month. The lymphocyte count fell in this case, being highest, 20%, before treatment. On the other hand there was only 8% in July although the patient had received no treatment for three months. Case 30 received 4 treatments with radium in four weeks of 3320 millicurie hours. A differential count two days after the last treatment showed 2% lymphocytes. In general it may be said that radium diminishes the lymphocytes, the maximum effect being seen about two weeks after treatment.

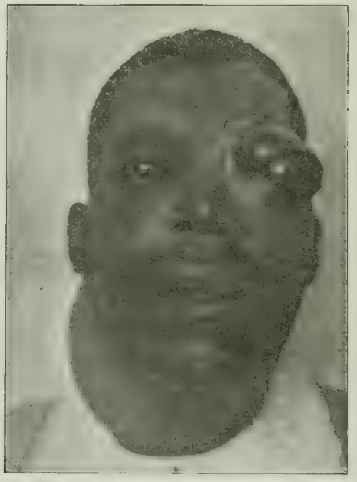

FIG. 7. Case 14. Photograph taken four months after Fig. 6. The masses of glands in the neck have recurred and there is a mass of tumor tissue in the left orbit. Death one week later. In the two previous photographs of this case, the left eye is slightly more prominent than the right.

No special platelet counts were made, but their appearance was noted in making the differential counts. We do not feel that much stress can be laid on this, as so much depends on the portion of the drop of blood taken, technic, etc. A note that they were diminished is probably a correct observation, but when they are noted as increased we feel that there is a chance of error.

We have gone over the examinations with special reference to the statement of Bunting and Yates, and while many do not correspond to their observations, about one-half can be made to conform. The percentage of polymorphonuclear neutrophiles said by them to be normal, 60 to 70, is much lower than other observers (Miller[18]). As regards the transitionals, the classification of these forms by different men varies, and what one calls large mononuclears others term transitionals. It is by transferring cells from the mononuclear to the transitional group that will make some of the blood examinations conform to those said to be typical by Bunting. Most of our blood examinations were made by one person. The third observations in Case 1 and Case 4 are examples. Case 31 shows an increase, almost constant, of the polymorphonuclear neutrophiles, with but little change in the transitionals. This patient at the present time is practically well, but still shows an increased area of dulness under the sternum, which was present at the first visit one year ago.

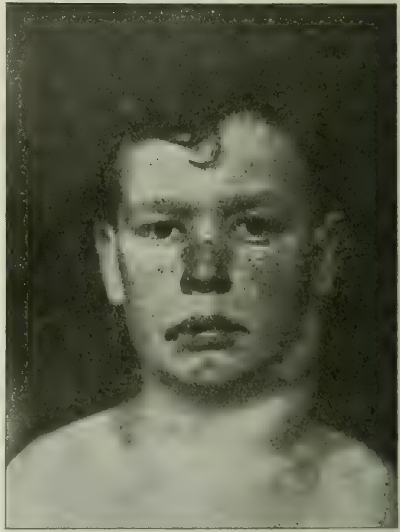

FIG. 8.—Case 26. Hodgkin's disease. Male, 11 years old. Eighteen months' duration. Masses of glands in the left side of neck. There were a few small glands in the right side. (See Fig. 9.)

HODGKIN'S CASES. BLOOD CHARTS.

	CASE 1			CASE 2	CASE 3	CASE 4		CASE 5			CASE 6		CASE 7		CASE 8	
	APR., '12	OCT., '12	JLY., '13	JAN., '14	NOV., '12	MAR., '13	APR., '13	DEC., '12	MAR., '13	AUG., '13	AUG., '13	APR., '14	JAN., '11	APR., '11	AUG., '11	SEP., '11
Polymorphonuclear neutrophiles	81	90	85.5	..	..	77	..	..	76	72.5	86	80	76	75.5	75.5	76
Lymphocytes	15	4	...	..	..	9	..	..	16	26.5	..	..	14.5	22.5	20.8	20
Large mononuclear	...	1	12.5	..	..	8	..	..	4	...	12	18	5	1.5	3.3	..
Basophiles	...	..	1	..	..	..	..	..	..	...	2	..	1	...	...	..
Eosinophiles	1	1	...	..	..	1	..	..	2	...	..	..	1	.5	.2	..
Transitional	.5	4	1	..	..	5	..	..	2	1	..	2	...	...	.2	..
Immature	...	..	...	..	..	..	..	..	..	...	..	..	2.5	...	...	4
Mast cells	...	..	...	..	..	..	..	..	..	...	..	..	...	...	...	..
			Died Oct., '12	Died Oct., '15	Died		Died Jly., '13			Died Sept., '13		Died May, '14		Died Apr., '15		Died Mar., '15
	Reds 4,392,000 White 14,000 Hgb. 81%	Reds 3,664,000 White 22,400 Hgb. 65%	Reds 3,656,000 White 12,400 Hgb. 70%	Reds 3,888,000 White 22,000 Hgb. 80%	Reds 4,816,000 White 9,600 Hgb. 90%	Reds 3,320,000 White 1,000 Hgb 80%	Reds White 8,000 Hgb. 80%	Whites 10,600 Hgb. 85%	Reds 3,408,000 White 8,000 Hgb. 70%	Reds 6,424,000 White 10,200 Hgb. 87%	Reds 4,888,000 White 18,000 Hgb. 80% Plates +		Whites 12,000 Plates +	Reds 2,880,000 White 10,000 Hgb. 60%	Reds 5,000,000 White 7,100 Hgb. 66%	Reds 5,120,000 Whites 7,000 Hgb. 75%

HODGKIN'S CASES. BLOOD CHARTS (*Continued*).

	CASE 11		CASE 12			CASE 13		CASE 14	CASE 17			CASE 22		CASE 23		CASE 26
	JAN., '16	FEB., '16	MAY, '15	SEPT., '15	DEC., '15	JUN., '15	JAN., '16	JLY., '15	SEPT., '15	APR., '16	MAY, '16	NOV., '15	OCT., '16	FEB., '16	MAY, '16	MAY, '16
Polymorphonuclear neutrophiles	75	70	76	84	81	88	..	79	80	76.5	80	66.25	65	52	12	73
Lymphocytes	21	21	8	10	10	8	..	20	10	9	14	14.75	8	40	70	5.5
Large mononuclear	1	2	4	20	..	1	..	..	4	5	2	15.5	21	5	6	16.5
Basophiles	2	..	..	..	..	2	..	..	2	...	..	....	..	2	12	...
Eosinophiles	1	..	1	..	3	..	..	..	..	2	2	1	5	.5	..	...
Transitional	..	7	10	4	6	2	..	..	4	6	..	....	..	.5	..	5
Immature	..	..	..	..	..	..	..	..	..	1.5	..	.75	..	...	..	...
Mast cells	..	..	..	..	..	..	..	1	..	...	..	.75	1	...	..	...
					Died June, '16		Died Jan., '16	Died Nov., '15							Died Mar., '16	Died Jly., '16
	Plates normal	Plates +	Reds 4,800,000 Whites 18,000 Hgb. 90% Plates +	Reds 5,200,000 Whites 9,800 Hgb. 90%	Plates + Plates normal	Reds 3,200,000 Whites 20,000 Hgb. 65%	Reds 2,400,000 Whites 10,000 Hgb. 60% Plates normal	Reds 5,440,000 Whites 8,600 Hgb. 90% Plates +	Reds 5,168,000 Whites 10,400 Hgb. 90%	Whites 10,800 Plates normal		Reds 3,504,000 Whites 13,200 Hgb. 80%	Whites 10,400	Reds 2,592,000 Whites 5,400 Hgb. 65%	Reds 2,672,000 Whites 4,000 Hgb. 50% Plates —	Reds 3,440,000 Whites 6,000 Hgb. 70% Plates +

Hodgkin's Cases. Blood Charts (*Concluded*).

	Case 28		Case 30	Case 31								
	Apr., '16	Oct., '16	June, '16	Nov., '15	Dec., '15	Jan., '16	Feb., '16	Mar., '16	Apr., '16	Jly., '16	Sept., '16	Nov., '16
Polymorphonuclear neutrophiles	57	82	90.5	74.83	78.8	77.7	77.25	85.5	80	88.66	88	85
Lymphocytes	37	14	2.5	20.71	12.5	10.6	12.25	8	10.25	8	4	13
Large mononuclear	5	2	2	1.08	.25	1.3	1.25	.5	....	....	8	6
Basophiles	...	..	...	.15	.25	...	.5	...	....	1	..	...
Eosinophiles	.5	2	...	.3	.75	1.1	.5	...	.25	....	..	.5
Transitional	...	..	5	2.93	9.25	8.8	8.25	6	9.5	2.33	..	...
Immature	...	..	...	....	....	...	....	...	....	....	..	...
Mast cells	...	..	...	....	....	...	....	...	....	....	..	...
	Reds 3,576,000 Whites 9,600 Hgb. 78%		Reds 2,064,000 Whites 35,000	Reds 3,742,000 Whites 16,000 Hgb. 80%	Whites 12,800 Plates normal	Whites 9,600	Whites 9,400 Plates normal	Whites 8,000	Whites 8,800 Plates normal	Whites 9,600 Plates normal	Whites 12,400 Plates dimin.	Whites 16,000 Plates dimin.

TREATMENT.

The treatment of these cases by radium and by the x-ray is followed by a marked temporary amelioration of symptoms, by a diminution in the size of the glands, and by improvement in the general condition, but it must be admitted that in the majority of the cases it has not prevented the progress of the disease to a fatal termination.

Radium and the x-ray have a selective action on tissues of the lymphadenoid type, and in Hodgkin's disease reduction in the size of the glands without burning or necrosis follows treatment, and there is a definite relation between the treatments and the effect on the gland. In this respect the action is different from that on carcinomatous tissue, where necrosis is to be expected.

That the radium treatment has not permanently arrested the disease, we feel is due in part to the fact that the treatments have been limited in almost every instance to the masses of palpable glands in the neck, axilla, or groin. A few cases only received treatments over the spleen, abdomen or sternum, but probably of insufficient strength to have much action on the deeply situated glands. We believe, from a study of these cases, that from the first there should be systematic treatment of the glandular regions of the body, whether there is evidence of enlargement of the glands or not, as the disease affects more or less all the lymphadenoid tissue. In all cases coming to autopsy, the mediastinal glands were involved, and our efforts should not be limited to a single group of glands as it is useless to treat those in the neck and ignore those in the mediastinum. In the nine cases that received considerable radium treatment, glands were noted as present in the mediastinum in 5, and probably present in 3 others.

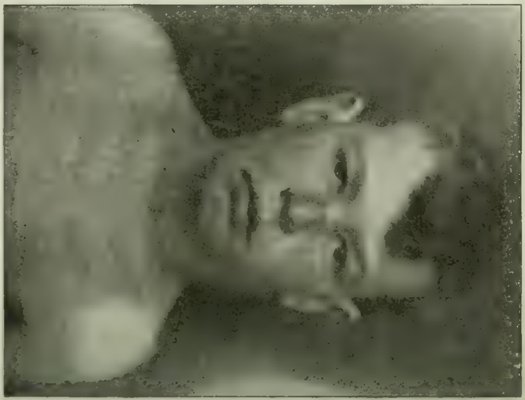

Fig. 9.—Case 26 two weeks after the first treatment with radium. Marked decrease in the size of the glands. Patient continued to improve under treatment until discharged two months later. Death six weeks after discharge. (See Fig. 8.)

Of the 19 cases of Hodgkin's disease, proved by a microscopic examination of one of the glands, 14 are dead and 5 are under treatment. The efficacy of any given treatment in Hodgkin's disease should be taken reservedly, as such narked temporary improvement may take place pontaneously. The 5 cases living may represent he chronic form of the disease. Cases 17 and 22, of 18 and 27 months' duration respectively, are in poor condition. Cases 11 and 31, of 22 and 36 months' duration respectively, are in good condition, and have only a few small shot-like glands. Case 30 is in fair condition, but has had little treatment.

Radium. The radium has been used in the form of emanation, which is collected and sealed in a capillary tube. This in turn is enclosed in a small metal jacket. Each tube represents from 10 to 250 millicuries of emanation, the strength varying with the age of the tube. The tubes are applied to the patient with a 2 mm. lead and 2 or 3 cm. gauze screen, and are left in position from 1 to 12 hours. In a few instances the tubes have been inserted directly into the mass of glands. In the treatment of the mediastinal and other deeply situated glands, the tubes are raised 2 to 4 cm. above the skin in order to obtain a maximum dose with less danger of burning the skin. Some skin reaction is very apt to appear in from one to two weeks. There may be a marked constitutional disturbance with nausea and vomiting, prostration and some fever following treatment with either radium or x-ray. These symptoms appear soon after exposure.

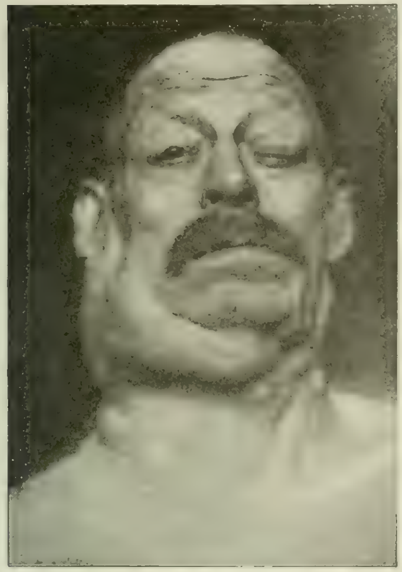

Fig. 10.—Case. 27. Lymphosarcoma of six years' duration. Male, 64 years old. A confluent mass in the right side of the neck and many discrete glands in the left side. There is also a mass of tumor tissue in the left upper eyelid. Death two weeks later. Autopsy.

Eighteen cases have received more or less radium treatment, but of these in only 13 was a specimen of a gland available for microscopic study. Of these 13 cases 3, now dead, received only one or two treatments, one being moribund when he entered the hospital. Of the remaining 10, 5 are dead and five under treatment, one having been under observation but a short time only. There are, therefore, 9 cases of Hodgkin's disease that have had sufficient treatment with radium to allow of conclusions being drawn as to its value. What sufficient treatment is, is difficult to say. The cases received applications from one to three times a month over periods of from three to twelve months, the usual treatment being from 600 to 1000 or more millicurie hours (see table). We are now using larger doses. In analyzing these nine cases, every one showed benefit by a diminution in the size of the glands and improvement in the general condition. The first effects on the glands were noted in from nine days to three weeks, averaging two weeks.

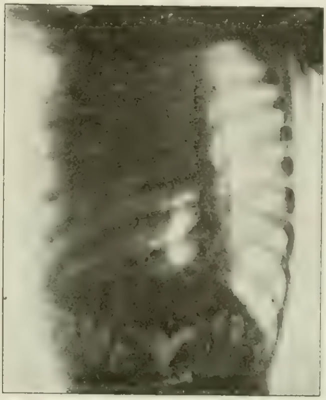

Fig. 11.—Case 5. Hodgkin's disease of four and one half years' duration. Female, 17 years old. Radiograph of chest, showing mass of glands in mediastinum. Death 7 months later. Autopsy. (See Figs. 12 and 13.)

In the five cases in which no specimen of a gland was available for study, two had considerable treatment, and in these there was also marked improvement, beginning about two weeks after the first application of radium. The other three received only small amounts of radium and no benefit was noted.

X-Ray. Nine cases received considerable x-ray treatment, three of which also received radium, but no specimen was available for examination on two of these. Two had treatments on an average of once a week at other institutions for over a year with benefit. The amount was not measured, and both are now dead. Another case, excluded for lack of microscopic specimen, received treatments regularly for over three years. We also have observations on five other cases who received a small amount of x-ray treatment.

There are in this series but five cases carefully treated with the x-ray, where the dose is known. Four improved under treatment, and in all of them the improvement is noted as beginning about two weeks after the first treatment. In the fifth case there was no change noted in the size of the glands. All but one of the cases are now dead, and that one also received considerable radium.

The x-rays when measured were usually given at a distance of 25 cm. through an aluminum filter, and with a brass cone. The voltage was 70 K.V. (See table.)

The impression is that the patients improve in general condition, and the glands treated diminish in size with the x-ray, but that the improvement is not as marked as with radium. The x-ray treatments were also directed against definite masses of glands, and no attempt was made to radiate all the lymphadenoid tissue of the body, as we believe should be done.

Pathology. Of the 19 cases, autopsies were obtained in 6, and in 3 we have specimens of glands removed before and after treatment.

The microscopic appearance of Hodgkin's disease is now fairly well known, and a detailed description of all the specimens will not be given. All our specimens were the typical so-called Dorothy Reed type of the disease, in various stages, some cellular and others fibrous, and in one gland removed for diagnosis was much more fibrous than those examined later at autopsy. Gibbons[19] believes that the endothelial cells, lymphocytes and fibrous tissue all proliferate, and that the microscopic picture of a given case is dependent on the relative amount of proliferation of the different elements. He classes Hodgkin's disease as a tumor.

The glands in ten of our cases were composed mainly of large cells of the endothelial type with vesicular nuclei and little protoplasm. Giant cells were common and lymphocytes were present in small numbers, but had been almost entirely replaced by the growth of the new-formed cells. In several cases the large endothelial cells appeared to be undergoing mitosis, and in some sections small areas of necrosis were seen. Eosinophiles were present in all sections in varying numbers, but were not numerous (Cases 1, 3, 7, 11, 12, 17, 22, 23, 26, 28).

The gland capsule was thickened in many cases, but in not a single instance was it infiltrated by the cells. In Case 31, however, a nodule removed from over the scapula showed the cells infiltrating the fat. The tumor cells were also not encapsulated in the autopsy cases where the spleen or liver were involved, but were infiltrating, and it is for this reason that the disease has been considered as a malignant tumor in its later stages. On the other hand, lymphadenoid tissue is present throughout the whole body, and it is a well-known fact that lymph nodes can develop where they are not usually found. In a few cases the tumor masses appeared elsewhere than in a gland, as in Case 13 as multiple nodules in the breast; Cases 14 and 28, nodule in the orbit; Case 6, nodule in the skin; Case 31, nodule under the skin of the back.

Specimens from two cases were what may be

RADIUM TREATMENTS.

CASE	NUMBER TREATMENTS	TOTAL MILLI CURIE HOURS	UNDER TREATMENT	IMPROVEMENT NOTED IN	OTHER TREATMENT	MEDIASTINAL GLANDS	REMARKS
2	14	9,440	9 mos.	2 wks.	x-ray	+	dead
11	21	12,586	7 mos.	gradual diminution	x-ray	0	good condition
12	15	10,156	12 mos.	18 days	0	+	dead
14	18	10,474	5 mos.	3 wks.	x-ray	?	dead
17	14	14,307	10 mos.	2 wks.	0	+	poor condition
22	11	12,990	8 mos.	2 wks.	0	?	poor condition
26	11	9,100	4 mos.	2 wks.	0	?	dead
28	15	11,447	3 mos.	9 days	0	+	dead
31	13	11,440	5 mos.	2 wks.	0	+	good condition
7	1	24	——	2 wks.	x-ray	+	dead
9	8	9,126	8 mos.	no improvement	0	+	dead, no specimen
10	23	11,232	6 mos.	2 wks.	0	+	dead, no specimen
13	5	small	8 mos.	no improvement	0	+	dead
15	9	6,434	6 mos.	no effect	x-ray	+	dead, no specimen
21	29	12,953	11 mos.	2 wks.	x-ray	+	dead, no specimen
23	1	1,024	——	no effect	0	?	dead
25	2	1,990	——	no effect	0	0	fair condition, no specimen
30	4	3,320	1 mo.	2 wks.	0	0	fair condition

X-RAY TREATMENTS.

CASE	TREATMENTS	UNDER TREATMENT	MILLIAMPERE MINUTES	EFFECT	OTHER TREATMENT	MEDIASTINAL GLANDS	REMARKS
2	"many"	24 mos.	——	improvement	radium	+	dead
4	6	2 mos.	165	improvement	0	?	dead
5	47	5 mos.	1370	improvement in 2 weeks	0	+	dead
6	22	8 mos.	790	no change	0	+	dead
7	22	6 mos.	565	improvement	radium	+	dead
9	25	10 mos.	1428	no change	radium	+	dead
11	10	4 mos.	510	improvement	radium	0	Good condition
18	"many"	36 mos.	——	——	0	+	dead
21	"many"	12 mos.	——	improvement	radium	+	dead
8	2	——	110	——	0	+	dead
14	3	——	——	——	radium	?	dead
15	1	——	——	no change	radium	+	dead, no specimen
19	1	——	100	——	0	+	dead, no specimen
24	1	——	——	no change	radium	0	recent case no specimen

Hodgkin's Disease.

Case	Age	Sex	Blood	Duration	Treatment	Result
1	24	female	3 exams.	9 mos.	salvarsan	Dead. Autopsy.
2	22	female	0	8 yrs., 9 mos.	cancer residue vaccines salvarsan Fowler's	Dead.
3	25	male	0	4 mos.	salvarsan	Dead. Autopsy.
4	28	male	1 exam.	10 mos.	salvarsan x-ray	Dead.
5	17	female	2 exams.	5 yrs..	x-ray	Dead. Autopsy.
6	25	male	2 exams.	18 mos.	salvarsan x-ray	Dead.
7	40	female	2 exams.	3 yrs.	x-ray radium (little)	Dead. Autopsy.
8	18	male	2 exams.	18 mos.	x-ray (little)	Dead.
11	35	male	2 exams.	21½ mos. to date	radium x-ray	Under treatment. Good condition.
12	46	male	3 exams.	21 mos.	radium	Dead. Autopsy.
13	37	female	1 exam.	1 yr.	radium (little)	Dead. Autopsy.
14	44	male	1 exam.	8 mos.	radium x-ray	Dead.
22	27	male	2 exams.	18 mos. to date	radium	Under treatment. Condition fair.
23	17	male	2 exams.	1 yr.	radium (little)	Dead.
26	11	male	1 exam.	2 yrs.	radium	Dead.
28.	18	male	2 exams.	7 mos.	radium	Dead.
30	27	male	1 exam.	11 mos. to date	radium	Under treatment. Condition fair.
31	19	female	9 exams.	3 yrs. to date	radium	Under treatment. Good condition.
17	27	male	3 exams.	2 yrs., 3 mos. to date	radium	Under treatment. Condition poor.

Hodgkin's Disease. Clinical Diagnosis Only.

Case	Sex	Age	Blood	Duration	Treatment	Result
9	female	25	3 exams.	2 yrs., 6 mos.	radium x-ray Fowler's	Dead.
18	male	20	1 exam.	5 yrs., 3 mos.	x-ray	Dead.
21	female	53	1 exam.	1 yr., 8 mos.	x-ray radium	Dead.
24	male	25	2 exams.	7 mos. to date	radium (little)	Under treatment (new case).
25	male	53	1 exam.	6 mos.	radium (little)	Dead.

Pathological Report Only Available.

Case	Sex	Age	Blood	Duration	Treatment	Result
10	female	54	1 exam.	14 mos.	radium	Dead.
15	male	17	3 exams.	1 yr.	radium x-ray	Dead.
19	male	51	1 exam.	3 yrs.	radium (little)	Dead.

Lymphosarcoma.

Case	Sex	Age	Blood	Duration	Treatment	Result
20	female	23	2 exams.	1 yr.	radium	Apparently perfectly well.
27	male	64	1 exam.	6 yrs.	radium (little)	Dead. Autopsy.
29	male	6	1 exam.	18 mos.	radium	Dead.

termed an earlier type than the foregoing, or correspond to the lymphatic type of Gibbons. In these there was some evidence of the anatomical structure of the gland remaining in places. The sections were composed chiefly of large lymphocytes, among which were many larger cells of the endothelial type and a few giant cells (Cases 8, 14).

Four specimens were of the fibrous type, and in these there was marked eosinophilia. The capsule was thickened, and the section was composed chiefly of fibrous tissue with islands of lymphoid, endothelial, and giant cells (Cases 2, 4, 13, 30).

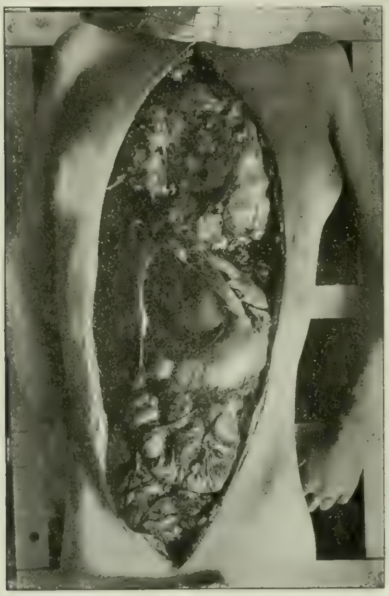

Fig. 12.—Case 5. Organs *in situ*, showing mass of tumor tissue in mediastinum.

In two cases we have sections of glands treated and untreated, both after x-ray. There are also two specimens removed for examination shortly after radium treatment.

Case 5. Received 35 treatments with the x-ray, to the glands of the neck only, during the three months immediately preceding death. At autopsy the glands of the neck presented the appearance of cellular Hodgkin's disease of the endothelial type, but there was some infiltration of the surrounding fat. A gland from the peritoneal cavity presented the same appearance, but there were some necrotic areas.

Case 6. Received 40 x-ray and 2 radium treatments directed against the glands of the neck and axilla. At autopsy these were no different than the peritoneal glands, both showed the cellular type of Hodgkin's disease.

Case 31. A nodule was removed from over the scapular, and also an axillary gland, both having previously received intensive radium treatment. The subcutaneous nodule was distinctly fibrous and the gland cellular, but no change due to the treatments could be demonstrated.

The following is a brief abstract of the autopsies and a description of the specimens. As these are typical, a detailed description of the rest of the specimens is omitted.

Case 1. Masses of enlarged lymph nodes in both sides of the neck and above the clavicles which were continuous with a large mass in the mediastinum. This had compressed the lungs and eroded the costal cartilages, ribs, and sternum. Fluid in both pleural cavities. The axillary glands were enlarged, as were also the periaortic and inguinal. The spleen and liver were normal.

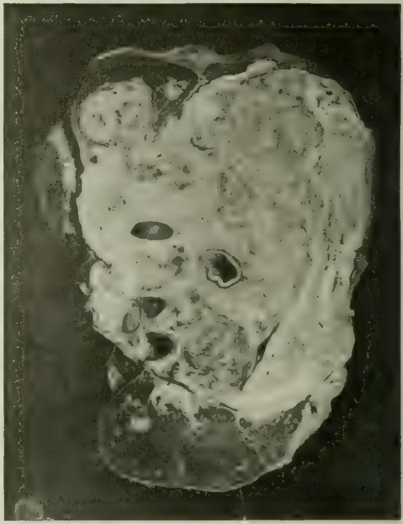

Fig. 13.—Case 5. Cross section of the thoracic organs. The lungs are compressed by the mass in the mediastinum and the left contains several nodules of tumor tissue.

Microscopic examination: Gland from neck removed six months before death. Capsule thickened. No normal anatomy of gland distinguishable. There were a few normal lymphocytes, but the bulk of the section was composed of cells larger than lymphocytes with vesicular nuclei lying in a fine stroma of fibrous tissue. In parts of the section there was much dense fibrous tissue and there were many eosinophiles. In the cellular portion were many large endothelial cells with vesicular nuclei and granular cytoplasm. They aften presented well-marked nucleoli. Giant cells of the endothelial type with two to four vesicular nuclei were common.

Axillary gland removed at autopsy. This section was similar to the previous one, but of a rather more cellular type. The capsule was thin and not invaded. Lymphocytes were present and were in considerable numbers under the capsule. The section was composed chiefly of large endothelial and giant cells. There was little fibrous tissue.

Case 3. Cervical lymph glands on both sides of the neck, enlarged and continuous with a large mass in the mediastinum which had eroded the sternum and invaded the left lung. The periaortic, pancreatic, and axillary lymph nodes were also much enlarged. The pancreas, liver and spleen were normal.

Microscopic examination: cervical gland. No normal anatomy of a lymph node remained. The lymphoid cells were practically entirely replaced by larger cells with vesicular nuclei and there were also many large endothelial cells. Giant cells were common. In places there was considerable fibrous tissue and there were many eosinophiles. A few of the endothelial cells were undergoing mitosis. There were several small areas of necrosis.

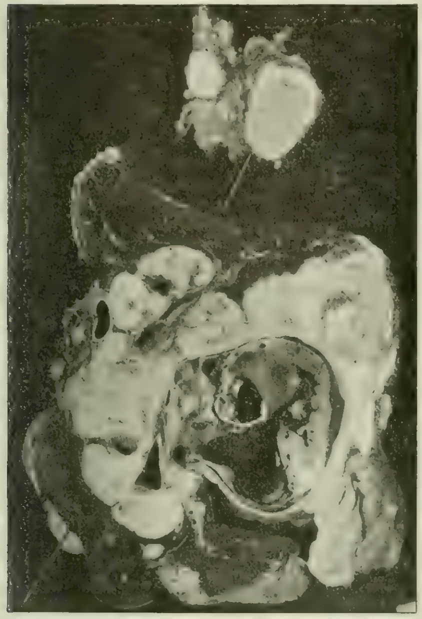

Fig. 14.—Case 3. Male, 25. Hodgkin's disease. Duration six months. Cross section of thoracic organs removed at autopsy. A mass of glands in the mediastinum surrounding the heart, and masses of tumor tissue in the lungs.

Gland from mediastinum. The section was similar to the foregoing, but there was more new-formed fibrous tissue which divided the gland into cellular islands. There were many lymphocytes, but the cells were mainly of the endothelial type and giant cells were numerous. There were many eosinophiles.

Mesenteric gland. This appeared to be practically normal. The anatomy could be distinguished, but among the lymphoid cells were a few large endothelial cells.

Case 5. Glands in both sides of the neck enlarged. Large tumor mass in the mediastinum, which had compressed the lungs and eroded the vertebrae. Large mass of glands about the pancreas and root of the mesentery. Liver enlarged but normal on section. Small tumor nodule in the spleen. Axillary glands enlarged on both sides.

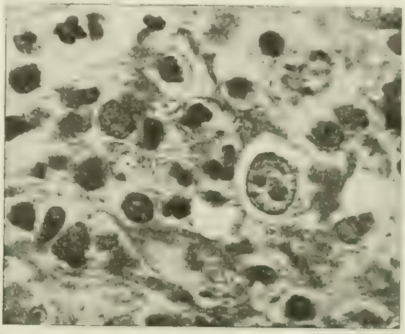

Fig. 15.—Hodgkin's disease. Section from gland removed from the neck of Case 8. Magnification 1500 diameters. The tissue had the appearance of a tumor and is composed of large endothelial cells, and of cells somewhat smaller, but of the same character. There are a few lymphocytes in the field. (Male, 18. Disease of 22 months' duration.)

Microscopic examination: Axillary gland. Cellular type of Hodgkin's disease. The capsule was thickened and there was no normal anatomy of the gland to be distinguished. There were many small areas of lymphoid cells, but the section was chiefly composed of large cells with vesicular nuclei and ill-defined cytoplasm. There were many endothelial and giant cells and a few eosinophiles.

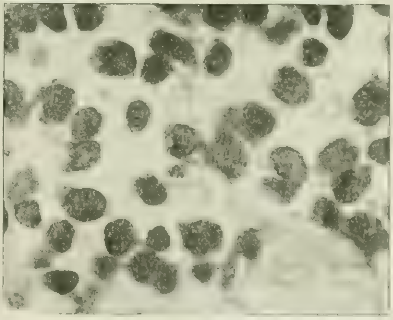

Fig. 16.—Section of gland of Case 27. Magnification 1500 diameters. Lymphosarcoma. The cells are all of the lymphoid type with little cytoplasm, and lie in a fine fibrous stroma. A thin walled blood vessel is to be seen. (Male, 64. Tumor of six years' duration.)

Mediastinal gland. The section was similar to the preceding except that there were many small areas of necrosis.

Case 7. The cervical, periaortic and peripancreatic lymph glands were much enlarged. There was slight enlargement of the mediastinal glands only. The spleen was enlarged and contained several areas of tumor tissue, and many small areas were also found in the liver. Some chronic peritonitis about spleen. A pure culture of the diphtheroid bacillus was obtained from the glands.

Microscopic examination: Section from two lymph nodes showed the same condition. There was no normal anatomy to be made out. The sections were composed of lymphocytes, large endothelial, and very large giant cells. Several of the endothelial cells showed evidence of mitosis.

Case 12. Cervical, bronchial, and retroperitoneal lymph nodes much enlarged. There was a mass of glands about the pancreas infiltrating that organ and obliterating the common duct. The liver and spleen were both enlarged and contained nodules of tumor tissue.

Microscopic examination. Cervical gland six months before death. Very cellular type of Hodgkin's disease, the section having the appearance of a tumor rather than a gland. There were few lymphocytes. The section was composed of fine bands of fibrous tissue separating small and medium-sized cells with vesicular nuclei. The cytoplasm and cell outlines were poorly marked. There were many larger endothelial cells and giant cells.

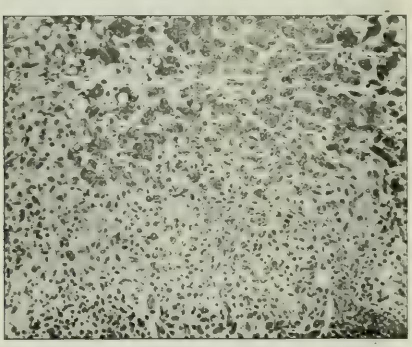

Fig. 17.—Hodgkin's disease. Section of nodule in the liver from Case 12. Magnification 240 diameters. The disease is infiltrating the liver tissue. (Male, 46. Disease of 19 months' duration.)

Gland at autopsy: This presented a similar picture to the above, but there was much more fibrous tissue.

Liver: This showed several small areas of tissue similar to the lymph nodes, but the cells were infiltrating the liver tissue and there was no suggestion of a capsule.

Case 13. Glands in both sides of the neck and both axillae enlarged. Right breast contains several tumor areas similar in appearance to the glands. The mediastinum was filled with a tumor growth which eroded the sternum. There was fluid in both pleural cavities. There was a mass of glands about the pancreas and abdominal aorta and several small ones in the pelvis. The spleen and liver were enlarged, but appeared normal on section. The inguinal glands were involved.

Microscopic examination: Cervical gland. The normal arrangement of the gland could be distinguished in places. The capsule was much thickened. The section was composed of large lymphocytes and endothelial cells, and in places there was an unusually large number of giant cells. There were also many eosinophiles.

SUMMARY.

We believe there is a distinct disease of the lymphatic tissues called Hodgkin's disease, which can be separated from Banti's disease, lymphatic leukemia, etc. We have had no opportunity to substantiate Warfield's and Kristjanson's observations. We found the diphtheroid bacillus in two out of the three cases in which it was sought, and think it can probably be demonstrated in many of the cases. The inoculation experiments in Guinea pigs and three monkeys were negative, and the piece of gland transplanted subcutaneously in the same patient from whom it was removed, atrophied and disappeared, which is an important observation, as a fragment of sarcoma or carcinoma treated in a like manner would probably have grown. This fact is rather against the tumor theory.

Microscopically, the glands were typical of what is known as the Dorothy Reed type of Hodgkin's disease, and were similar to the cases reported by Reed,[20] Longcope,[21] and Simmons.[22] The cases of lymphosarcoma presented microscopically an entirely different appearance, and in the one case that came to autopsy no gland examined had the slightest resemblance to Hodgkin's disease.

Clinically, Hodgkin's is a fatal disease, that runs an acute or chronic course, little affected by treatment as regards the ultimate fatal result, It may usually be suspected, but there is no way to make a definite diagnosis without a microscopic examination of one of the glands. It cannot be differentiated clinically from certain cases of lymphosarcoma, tuberculosis, or even inflammatory glands. In our series the blood picture was not constant, and although we do not feel able to make a diagnosis on it alone it is often quite suggestive.

As regards treatment, radium and the x-rays have a distinct beneficial effect, radium being of more value than the x-ray. With treatment, the glands diminish in size, and the general condition improves. The relation between the treatment and the improvement is definite, and is seen in from one to three weeks after the first application of radium. We have no cases that can be called cured, but the patients are comfortable and able to attend to their duties until nearly the end of the disease. We do not know if the fatal termination has been much postponed, as the cases most benefited may have the chronic form of the disease. The treatments should not be limited to the palpable glands, as is usually the case, but should be directed against the lymphatic areas of the body, the mediastinum, abdomen, etc., from the first.

LYMPHOSARCOMA.

Three cases diagnosed clinically as Hodgkin's disease were found, on a microscopic examination of a gland removed, to be lymphosarcoma. Clinically, we see no way to differentiate these cases from Hodgkin's disease. In two cases the lymphocyte count was high, although the white count was not increased. It would have been interesting to have examined several glands, removed at different times from these cases, but it was not possible. One case came to autopsy, and examination of many of the glands all gave the same microscopic picture (Case 27).

The cases in detail are as follows:

Case 20. Female, 23 years old. Tumor of right side of neck for 6 months. No known etiology. Examination: A well-developed and nourished woman. There is an oval tumor in the right side of the neck just above the clavicle 3 ins. in greatest diameter, which is freely movable. Above and below this are many freely movable enlarged glands. Many enlarged glands present in the left side of the neck, and both groins. No glands palpable in the axillae. Teeth and tonsils not remarkable. Chest normal. Spleen and liver not enlarged. Blood pressure, 90. Differential count—see table.

The patient received two treatments with radium in two weeks, followed by a marked diminution in the size of the glands.

The patient did not return, but was seen one year later. At that time there was a mass of discrete glands in the right side of the neck, none in the left. The inguinal glands and those in the right axilla were also enlarged. Otherwise she seemed well. She had been married and had a baby four months old.

Microscopic examination of gland removed from neck. Capsule not infiltrated. The normal arrangement of a lymph node can be distinguished in places. The cells are of the lymphoid type but rather large, and there are many mitotic figures. There are no endothelial or giant cells.

Case 27. Male, 64 years old. A large tumor of the right side of the neck was removed three years ago, but returned three months ago. Since then it has varied in size and at times almost disappeared. The tumor in the neck first appeared after a severe cold in the head. (The patient was very stupid when admitted, and a history was obtained with difficulty.) Examination: Emaciated, very sick elderly man. Large masses of large, freely movable glands in both sides of the neck, axillae and groins. A tumor under the skin over the occiput the size of a grape fruit and a smaller one of the left eyelid. No evidence of enlarged mediastinal or abdominal glands. Spleen not felt. Considerable ascites and edema of the skin over the abdomen and of the lower extremities. Urine,—of chronic nephritis. Blood—see table. Temperature subnormal during stay in hospital. Patient failed and died two weeks after admission to the hospital.

Autopsy: Large mass of discrete glands in the left side of the neck. In the right side of the neck was an infiltrating tumor. There was also a tumor over the occiput and in the eyelid. Masses of discrete enlarged glands in both axillae and groins. The pancreas was imbedded in a mass of enlarged glands which extended down the aorta to the pelvis. There was a chain of glands on each side of the manubrium and a large tumor mass in the mediastinum. Liver and spleen normal.

Microscopic examination was made of many of the glands, but all presented the same picture. No normal arrangement of a lymph gland could be distinguished. The glands were composed of small lymphocytes, some of which appeared to be undergoing mitosis, separated by fine bands of fibrous tissue. There were many thin-walled blood vessels. The nuclei of a few of the cells were slightly vesicular in character. No endothelial cells were seen. In places there were clumps of eosinophiles.

Case 29. Male, six years old. One year ago, without cause, a tumor appeared on the left side of the neck, which slowly increased in size. No pain or other symptoms. The tumor was removed one month before entrance. Examination: Poorly nourished small boy. There was an operation scar extending from the mastoid process to the clavicle on the left side of the neck. A few hard, movable glands could be felt in the region of the scar. No glandular enlargement elsewhere in the body. Chest and abdomen negative. Urine normal. Blood pressure, 80. Blood—see table.

The patient has received six radium treatments to date. The small glands have disappeared and the general condition has much improved. An indefinite thickening can be felt however, behind the clavicle extending down into the mediastinum.

Microscopic examination of the tumor removed. The section showed a very cellular tumor, composed chiefly of small lymphoid cells, and cells, somewhat larger, but of the lymphoid type. These latter had slightly vesicular nuclei. The cytoplasm was poorly marked. The section was traversed by few fine fibrous trabeculae, and about these a few larger cells of the endothelial type were seen.

	Case 20		Case 27	Case 29
	Nov. '15	Oct., '16	Apr., '16	Sept., '16
Polymorphonuclear neutrophiles	80	67	37	50
Lymphocytes	10	15	53	37
Large mononuclear	..	..	4	10
Basophiles	..	7	..	1
Eosinophiles	1	4	2	..
Transitional	8	7	22	..
Immature	..	..	..	..
Mast cells	1	..	2	2
			Died Apr., '16	Died Mar., '17
	Reds 3,504,000 Whites 8,600 Hgb. 80%	Whites 10,000	Reds 3,320,000 Whites 10,000 Hgb. 60%	

REFERENCES.

[1] Steenberg: Cent. f. d. Grenz. d. Med. u. Chir., Vol. ii, p. 641, 1899; Zeits. f. Heil., Vol. xix, p. 21, 1898.
[2] Cunningham: Am. Jour. Med. Sc., Vol. clxxvii, p. 686, 1915.
[3] Bunting and Yates: Arch. of Int. Med., August, 1913.
[4] Bunting and Yates: Jour. Am. Med. Assoc., Vol. lxi, p. 1803, 1913.
[5] Bunting and Yates: Jour. Am. Med. Assoc., Vol. lxii, p. 516, 1914.
[6] Negri and Miermet: Cent. f. Bact., Vol. lxviii, p. 292, 1913.
[7] Billings and Rosenow: Jour. Am. Med. Assoc., Vol. lxi, p. 2122, 1913.
[8] Rosenow: Jour. Am Med. Assoc., Vol. lxiii, p. 903, 1914.
[9] Bloomfield: Arch. Int. Med., p. 187, 1915.
[10] Yates and Bunting: Jour. Am. Med. Assoc., Vol. lxviii, p. 747, 1917.
[11] Bunting and Yates: Bul. Johns Hop. Hosp., Vol. xxvi, p. 376, 1915.
[12] Warfield and Kristjanson: Am. Jour. Med. Sc., August, 1916.
[13] Yamasaki: Zeits. f. Heil., Vol. xxv, p. 269, 1904.
[14] Karsner: Arch. Int. Med.: Vol. i, p. 175, 1910.
[15] Tyzzer: Jour. of Cancer Research, Vol. i, No. 2, 1916.
[16] Zeigler: Quoted by Cunningham, 1911.

[17] Bunting and Yates: Jour. Am. Med. Assoc., June 12, 1915.
[18] Miller: Bul. Johns Hop. Hosp., Vol. xxv, p. 317, 1914.
[19] Gibbons: Am. Jour. Med. Sc., Vol. clix, p. 692, 1906.
[20] Reed: Johns Hopkins Hosp. Rep., p. 134, 1902.
[21] Longcope: Bull. Ayer Clin. Lab., Vol. i, p. 1, 1903.
[22] Simmons: Jour. Med. Research, Vol. ix, p. 378, 1903.

BIBLIOGRAPHY.

Oliver: Jour. Med. Research, Vol. xxix, p. 191, 1913.
Ewing: Jour. Med. Research, O. S., Vol. xxviii, p. 1, 1913.
Steele: Boston Medical and Surgical Journal, Vol. clxx, p. 123, 1914.
Moore: Jour. Infect. Dis., June, 1916.
Simon and Judd: Jour. Am. Med. Assoc., Vol. lxiv, p. 1630, 1915.
Annual Report Radium Institute, London, 1914.
Wickham, Degrais: Radium Therapie, 1912.

THE PETERSHAM PLAN.*

By William R. Woodbury, M.D., Rochester, N. Y.

Certain facts now stand generally accepted. These facts are: That defective teeth and neglected mouths fill a large place among the physical defects of growing children—and with grownups, too; that neglect to bestow regular care upon the teeth and mouth brings physical disaster; and that mouth hygiene holds a place of vital importance in the life of every individual and of every community.

Each new survey carefully made and accurately recorded adds corroborative evidence in support of these facts. In May, 1915, the United States Public Health Service completed a sanitary and medical survey of the rural schools of Porter County, Indiana. The survey was undertaken on request of the Indiana State Board of Health, and the health and school officials of Porter County, "because of the recognized importance of school hygiene to public health." This investigation included a sanitary survey of school locations and buildings, a study of the physical fitness of rural school children, and mental tests of these children. In June, 1916, a report of the survey, prepared by direction of the Surgeon General, was published as a United States Public Health Bulletin.† The report introduces itself thus: "On the basis of the results obtained, recommendations were made to the health and school authorities of Porter County. It is believed that many of these are of general applicability, and they are, therefore, included in the following report of the results obtained in this investigation." The generally common belief that a greater number of rural children suffer from physical defects than is the case in cities, because of the greater and more generous medical opportunities and privileges open to the latter, was not verified. "When compared with the reports of inspections made in urban communities, the results of this survey do not confirm this belief. The fact remains, however, that an undue number of the children in rural schools are found suffering from the results of misuse of the special senses and from diseases of these organs which require the services of specialists, unfortunately denied in great measure to the larger part of the general population."

In the text of this report, and following a table which gives in detail physical defects found in medical examination of 2,451 children attending the rural schools of Porter County, is the following statement on oral hygiene: "The results of these examinations show the necessity of greater care of children's teeth in rural communities. Especially is this true of deciduous, the so-called 'milk' or temporary teeth. These should be preserved as long as possible. When the temporary teeth are lost too early or at too long an interval before the eruption of the permanent teeth, shortening of the jaw takes place, and the permanent teeth erupt in an irregular manner. The child should therefore be trained in the use of the toothbrush at an early age. The undue number of children who never used the toothbrush, as revealed by these examinations, the still greater number who used it only occasionally, and the failure to provide for dental service in case of the younger children, call for greater attention on the part of the parents for the protection of the physical and mental fitness of their offspring."

Defective teeth were found to be the major physical defect in the Porter County rural school children; it leads by a wide margin all other defects. Seven hundred and forty-nine (60 per cent.) of the boys, and six hundred and thirty-seven (50 per cent.) of the girls had some form of dental defect. Two or more defective teeth are recorded in 54.5 per cent. of the boys, and 44.2 per cent. of the girls. The highest percentages of defective teeth were observed from the fifth to the eleventh years. Two or more missing teeth also gave the highest percentage in children between the fifth and eleventh years; 28 per cent. in the fifth year and growing into 45.5 per cent. by the eighth year for the boys, 25.8 per cent. in the fifth year and increasing in the seventh year to 37.5 per cent. for the girls. During the period when the deciduous teeth should be doing their work—every temporary tooth sound and in its appointed place doing its full share of the work of sustaining sound nutrition—the greatest number of both defective and missing teeth are recorded. Malocclusion was "observed in marked degree in 4.8 per cent. of all the children examined." The extent to which dental correction had been practised was "slight" up to the eighth year. Only 14.1 per cent. of the boys and 19.7 per cent. of the girls had received any form of dental attention. Daily use of the toothbrush was acknowledged by 13.9 per cent. of the boys and 40.9 per cent. of the girls.

Of the 2,451 rural school children studied during the Porter County survey there was an almost equal distribution of the sexes—1,253 were boys, and 1,235 were girls.

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* Given before the Tenth Congress of the American School Hygiene Association at Albany, New York, June, 1917.

† Public Health Bulletin No. 77, June, 1916. Rural School Examination, including Physical and Mental Status of School Children in Porter County, Indiana. United States Public Health Service, Washington, D. C.

Age Distribution by Sex and One Year Age Periods.*

Age in Years	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Boys	25	79	136	121	127	125	110	125	116	112	74	49	20	7	6	2	2
Girls	31	89	104	118	135	127	115	128	109	91	67	50	28	17	5	1	0

* Table III, Public Health Bulletin No. 77.

The total number of physical defects found among the boys was 2,228; among the girls 1,785. Both the boys' and girls' physical defects totaled 4,013.

In the following table are listed those of the physical defects of which the number of each one reported was twenty-five or more:—

	Boys	Girls	Total
Hearing defective	392	348	740
Nose and throat:			
Adenoids	166	122	288
Pharyngitis, chronic hypertrophic	16	31	47
Tonsils:			
Enlarged	89	106	195
Requiring surgical treatment.	106	84	190
Spinal curvature; functional	25	11	36
Vision defective	592	550	1142
Teeth defective	749	637	1386

Based on the Indiana Survey the report draws this conclusion:—"The large number of children presenting physical defects of such gravity as to demand specialized medical and surgical attention is an evidence of the need of medical supervision of the school children of the county, in the interests of the child's educational advancement and for the protection of community health."

These examinations and the results recorded are representative of the youthful population not only of Porter County, but of rural communities everywhere. The delicate physical and mental adjustments of children are much more easily disordered than is the case with adults. Minor physical defects, which ordinarily work no noticeable damages upon a grown person, may prevent normal physical and mental growth of the child. Defects of hearing and vision, adenoids, enlarged tonsils, nutritional disturbances, malnutrition, and defective teeth react injuriously on both the physical and mental development throughout all the years of childhood. Upon the remote damages foreshadowed it is not necessary to dwell; but they come plainly into view. To the mouth—to neglected mouths, decayed teeth, and gum abscesses can be traced 20 per cent. of all diseases.

Education is something more than imparting didactic instruction. Giving to the child the foundations of sound physical and mental health, and helping him build for himself a strong physical house which will withstand wear and use is equally important; it is likewise a duty demanded of parents and school authorities. The educator is vitally interested in the physical development and perfection of the school child. Definite knowledge of the physical condition and defects of school children is of value in determining and removing unhealthful influences and conditions in season; and when physical defects cannot be corrected, but must needs be carried along, the educator is better able to adapt mental instruction to physical handicaps as each individual child requires. Every manufacturer knows that however perfect his organization and its machinery, if material that goes into it is bad he turns out "seconds"; and the manufacturer has the advantage of school people in that he can put his goods on the market and label them "seconds." But they are not to his credit; it is not good business. No more is it to the credit of school people to work with poor material; at least not to try to eliminate the major physical defects in the raw material offered them.

Public Health Bulletin No. 77 is noteworthy, and in two particular ways: It records the first complete physical survey of a large and representative number of rural school children; the principal industry of Porter County is agriculture, and the survey included children attending 76 rural schools. Secondly, it stands as unquestioned authority as to the existence of facts which demand recognition from parents, and school and health authorities. With these facts concerning rural school children,—of the 30,000,000 children in the United States, three-fifths, or 18,000,000, are rural children,—with their pressing needs emphasized now as never before; and with these vital needs calling for prompt attention and treatment, an effort to put ourselves right with our duty should be shaped into action. Neither excuse nor reason stands valid against prompt action.

For myself, and for those of us who, a few years ago, recognized this duty and began to call for a new education in mouth hygiene, I wish to express a discerning appreciation of the value of the Porter County Survey. It brings substantial aid for the organization of countrywide intelligent public sentiment into the upgrowth of active effort for helping rural children make fullest use of their rights for healthful living. A recent warning against bodily decline—a warning by a master of facts and figures about the health of Americans, the Conservation Commissioner of the Equitable Life Assurance Society—states, in visualizing the "Physical American":—"His teeth put up a good front, but they need attention. Lack of professional care and of exercise due to the increase in soft, unresisting foods has impaired the health of both the teeth and gums. His digestive organs have been given so many new and arduous duties to which they were not trained that they are showing signs of rebellion. He could detect and head off these troubles if he would go to his doctor for an occasional examination." The mortality rate from the wear and tear of life is gaining too fast. Low-powered or substandard men and women—and children—are increasing in number. To check the vital waste—the waste of national vitality—is an imperative national duty. The median age at death of the American people is about 43 years.

In Petersham, an agricultural community in Massachusetts, a practical plan has been inaugurated to give its school children dental service. The immediate needs of such service are no greater in this country town than in hundreds of others throughout the country. But this Massachusetts town is convinced of its needs; and it is convinced, too, that the small amount of money required to equip and maintain a service which provides for the care of its school children's teeth and mouths is money wisely used. Petersham thus puts itself on record as the first rural community to organize a town dental clinic.

Ten years ago there began, in Boston, an upgrowing of an appreciation of what a clean whole mouth, with a full complement of sound natural teeth, means. At first accepted as theory-reasonable, it grew into being taken as worthy of practical consideration. Each successive year developed a growing intelligent appreciation with a gradually widening company of supporters—of those who gave their support and efforts to promote mouth hygiene. An elightening progress was being upbuilt, and steadily, and always through public opinion which continually was strengthening itself.

Facts as to the condition of children's mouths —and as they are—facts which should be faced squarely—were gathered. All the physical data assembled and recorded lead to a single conclusion: In every community opportunity for professional dental care of children should be provided. Rare was the child who did not have one or more decaying or missing teeth, or both —who did not need prompt dental attention. Large numbers of children were found everywhere to be suffereing from mouth defects of such gravity as to call for immediate attention. Much sickness, many diseases, frequent absence from school and poor school-work were discovered to be due directly to neglected teeth and mouths. From the same causes came disordered eyes, ears, nose and throat; and not infrequently infectious diseases, including tuberculosis, were invited and "carried" by neglected mouths. Out of 118,781 public school pupils in Boston examined, 100,236, about 84 per cent., of the defects found were those originating about the mouth, 51,340, about 66 per cent., being dental defects. Nutrition and normal growth and development are being interfered with continuously, because the mouth cannot do its full share of the work which is demanded to maintain sound body-health.

These facts, and the story of the many added perils which lie across the path of growing children who do not have proper and timely dental care, are not new. They have been told many times, and need no further telling now. Everyone knows, too, how within these few years the new education in mouth hygiene has developed; and how it is beginning to find its place in school and community life. It is surprising that decay and abscesses in the mouth, which were hidden from sight, have been so calmly ignored and left to themselves to develop to the full their evil work. Let an abscess but appear anywhere else in or upon the body than in the mouth, and straightway, without delay, a physician is seen, and prompt attention is given to it.

Dental attention is now provided in public schools in the larger cities, and in many urban communities. Hospitals and dispensaries now provide dental service, and dentists are a part of their working staffs. In Boston a noble and unique institution—the first of its kind in the world—has been built, and equipped and endowed with princely generosity, The Forsyth Dental Infirmary for Children. A generous giver and benefactor to humanity has given to Rochester, New York, a similar institution, likewise with a munificent endowment—The Rochester Dental Dispensary. In this wise has enlightening progress been upbuilt, and the vital dental needs of city children been met.

But the rural children—there are 18,000,000 of them in the United States—have no opportunity for dental attention and care. But hope is growing nearer to achievement. Petersham offered favorable soil for good seed. Some of its people had come to know what mouth hygiene means. A native interest had begun to develop; the same kind of interest which requested the Porter County Survey,—"because of the recognized importance of school hygiene to public health."

There is but one right way to lay secure foundations for a community service. Human nature is the same everywhere. Local public opinion has to grow, and develop itself into accepting apparently commonplace facts. Having accepted them, then to shape itself into the action which puts itself right with its duty as the community sees it. Local interest and the encouragment and use of local talent was the foundation upon which the Petersham Plan was upbuilt. A visit was made to Petersham—a preliminary survey. The need of professional dental attention for its school children was being talked about, and sentiment in its favor was growing. There was no dentist, either settled or visiting, in the town. Athol, the nearest adjoining town, and nine miles distant, had one dentist. Neither a railroad nor trolley-line passed through Petersham. The chairman of the town school committee was heartily in favor of the town fulfilling its duty. Need of professional dental attention for the school children was recognized by the school superintendent; he favored the plan, and urged the town not to postpone performing this duty. One of the village physicians recognized its need; and he was helping promote sentiment in its favor; he was giving it hearty support. The seed was growing.

In October, 1916, the writer (a medical man) and a Boston dentist were invited to speak in the Town Hall. Mouth Hygiene holds equal interest to the physician and the dentist. A physician who would do his full duty to his patients and to the community must realize what neglected and diseased teeth and mouths mean. He should always know first-hand what condition the teeth and mouth are in; and whenever their condition is hostile to whatever course he may elect to follow, he should see to it, and promptly, that they are made right. Not infrequently diseases are stubborn and refuse to yield when the physician and dentist do not work together.

The audience which filled the Town Hall—the town fathers and mothers, school children, the school and health authorities—was convincing proof of the growing public sentiment. The "meeting" was a success; and from that time on the active work of organizing the Petersham Plan moved forward. To the townspeople of Petersham was lent the organization of the Massachusetts Dental Hygiene Council. In a visit to Petersham the president of the council made a careful survey. Arrangements were made for preliminary examination of the school children. These examinations were carefully made by a skilled and experienced dentist; the condition and defects found were recorded; and the expense of the equipment needed and of the work required to be done was estimated. At a town meeting on February 5, 1917, a report was made upon the preliminary survey, and the Town voted $200 for dental care of its school children. Two and seven-tenths (2.7) per cent. of the Petersham school children examined have mouths with no evident defects. The remainder, ninety-seven and three-tenths (97.3) per cent., were found to be defective.

Money for the purchase of the equipment was contributed by "summer" and "year-round" townspeople. The equipment and the clinic were installed in the high school building. Through the coöperation of the Forsyth Dental Infirmary for Children, in Boston, a town school dentist was secured—an operator with previous experience in this special field of work. Before the work of the school clinic began, many of the pupils in the town high school began, of their own initiative, seeking dental treatment of the nearest dentist—nine miles distant. Several of the parents asked to have the dentist, who was coming to do the school-work, work for them; and they volunteered to pay him as they would any dentist. These parents know they need professional care, too; and the time and expense demanded, along with the loss of days of work, in driving to another town to a dentist, means much to them.

On April 2, 1917, the Petersham town clinic was opened. The town pays the operating expenses. Each patient treated is charged a nominal sum an hour for dental work; and a small charge is made for material used. Quite 50 per cent. of the town school children had never been to a dentist. Some of those who made their first visit to the dentist's chair were eighteen years old. The chairman of the School Committee says: "The plan has met with great success, and people are wondering how we are to get along without a dentist in town. The school dentist has been called nights and Sundays to fix toothaches and do dental work for the parents and townspeople. He has been able to do quite a lot of outside work—in fact, about all that time could be found to do."

Petersham was good soil. And now neighboring towns are developing a new interest in mouth hygiene. They are beginning to recognize the importance of school hygiene to public health. The town of Hardwick, an adjacent agricultural town and one of the three towns sharing a school superintendent with Petersham, asks for a lecture on mouth hygiene. Our hope is that the work started at Petersham will extend to all rural communities—and urban, too, —where such work is needed, which means "all places where human beings reside."

A practical working plan—as is the Petersham Plan—can be adopted in every rural community. The facts herein given need no further corroboration. Money and time spent now in seeking proof and in experiment are wasted. With first a careful study of local conditions and a little encouragement to help in upbuilding local public sentiment, and with a small expenditure of money,—which will buy large returns,—a practical working and self-supporting school dental clinic can be organized and maintained in every community; which leads to the adoption of another community need,— the rural school nurse.

Three years ago the Dental Hygiene Council of Massachusetts prepared a Standard Lecture on Mouth Hygiene—an illustrated lecture on "The Care and Use of the Human Mouth,"—which presents in an attractive and interesting form the facts which the public needs to know. For a nominal rental fee a speaker may secure all that is needed for an interesting and instructive discourse—everything except the speaking voice. The manuscript and lantern slides are rented to any properly qualified person who is desirous to present the matter in public. To date this Standard Lecture has been presented before more than half a million people.

A new field of work, and one for which the greatest need exists, is being undertaken by the Massachusetts Council. The public dental clinic, to be successful, must be conducted with economy as to cost and with an increase of efficiency and service. Standardization of the dental clinic, in simple terms, is the adoption of definite or standard rules of organization, equipment, operative procedure, and general management. It is the purpose and intent of the

Dental Hygiene Council of Massachusetts to carry out the full solution of this important undertaking—to meet the very evident demand which exists for the standardized dental clinic.

The Petersham Clinic is the first rural dental clinic to be put into operation in this country. It is a standard dental clinic of the rural type. The Petersham Plan is an unqualified success. Rural children need dental attention; opportunity to get it should not be withheld from them. Withholding it works unnecessary hardships to those whom we wish most to protect.

TRI-NITRO-TOLUENE POISONING IN MASSACHUSETTS.

By Thomas F. Harrington, M.D., Boston,
Medical Deputy Commissioner of Labor, Massachusetts.

Industrial poisoning by the different derivatives of benzene compounds of the coal-tar group of chemicals* has loomed into prominence in this country during the past two years chiefly because of the use of these compounds in the manufacture of high explosives and dyestuffs, as well as because of their use as motor fuel. Among the cases of industrial poisoning due to benzene derivatives reported to the State Board of Labor and Industries since November, 1915, there were 17 cases with 4 deaths, attributed to tri-nitro-toluene. Before taking up the consideration of these cases it may be of interest to set forth some of the fundamentals of industrial poisoning by chemical gases, fumes and dust.

CLASSIFICATION.

No satisfactory classification of industrial poisons, nor of occupational diseases attributed to such, has received general adoption. The difficulty of agreeing to any fixed classification is apparent when we realize the variations in the relative toxicity of the various compounds and of the various processes in which they are used. As a result of dilution with air, most industrial poisons can be absorbed only in very small doses, and yet, notwithstanding this, some are so much more injurious than others that the symptoms described may give no idea of the relative dangers of one or the other. Again, in regard to many substances the term "industrial poison" is a misnomer until the amount absorbed reaches a certain point, *i.e.*, beyond the powers of the individual to eliminate from his system the poison taken in. Individual susceptibility or immunity plays a very important part in this group of industrial poisons. Many poisons affect several organs at the same time, hence any classification based upon such a basis of action would be cumbersome and confusing. However, a classification, based upon the predominating action of the poison, groups the problem quite arbitrarily as follows:

(1) Irritating to skin or mucous membrane, *e.g.*, acids and alkalis;

(2) Destruction to the normal character of the red blood cells, *e.g.*, aromatic series of organic poison—nitro and amido derivative of benzene, arseniuretted hydrogen gas, carbon monoxid and cyanid compound;

(3) Affecting the brain and nervous system, *e.g.*, carbon compounds and carbon bi-sulphid.

Another classification of not only fumes and gases, but of industrial poisons in general, is that founded upon a chemical basis, *i.e.*, organic and inorganic, with a subdivision of the organic into (*a*) the unsaturated carbon compounds, (*b*) the aromatic series; and the inorganic into (*a*) non-metallic, (*b*) metallic.

The nitro- and the amido-derivatives of benzene, *e.g.*, nitro-benzol, dinitro-benzol, paranitrochlorobenzene, anilin oil, paranitranilin, dinitrotoluene and tri-nitro-toluene act mainly on the blood, converting the hemoglobin of the red blood cells into methemoglobin and leading to solution of the red cells. While both nitro- and the amido-derivatives resemble each other greatly in their action, nevertheless, there is a distinction in their action that affects markedly the symptoms produced by each. Both are readily absorbed in the form of fumes or dust by the skin and lungs. Taken by the mouth, either produces rapid poisoning. The pathology in each case explains readily the symptoms: the nitro-derivatives dissolve the red cells and the freed hemoglobin reaches the liver, where it is converted into bile coloring matter. The bile becomes more inspissated, hence jaundice. The hemoglobin remaining in the blood becomes converted into methemoglobin, which gives to the workers the ashen gray or cyanotic (bluish) color of the lips and complexion that characterizes this group of workers. The power to take up oxygen is gradually lost, resulting in the development of dyspnea or symptoms of air hunger, nausea, vomiting, headache, giddiness, severe nervous symptoms, feeling of anxiety and, in severe cases, unconsciousness, lividity and death. The unoxygenated blood sets up irritation of the central nervous system, especially in the medulla, and a comatose condition ultimately ensues. Accompanying this blood change is a rapid, small pulse and feeble heart action, noted by many observers. If the destruction of the red blood cells becomes so rapid or increases so extensively that the liver cannot convert the hemoglobin into bile pigment, some will pass on to be excreted as characteristic darkly colored urine. In contradistinction to the nitro-derivatives, it has been observed quite generally that after absorption of the amido compound (anilin), conversion of hemoglobin into methemoglobin precedes the destruction of the red blood corpuscles. This blood may be found in the urine of anilin workers, but rarely bile pigment; a marked reduction of hemoglobin is characteristic of anilin workers. The blood in either case, *i.e.*, in nitro or in amido, whenever the stage of jaundice or cyanosis has been reached, is chocolate in color and shows bands on the spectrum of methemoglobin, granular degeneration of red cells, alteration in their form and color, and after a few days nucleated red cells marking regenerative changes. Many observers have remarked on the prevalence of tumor of the bladder of men exposed to anilin poisoning.

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* Not to be confounded with *benzine* of the petroleum group.

Poison may take place from the initial substance used in the process of manufacture (benzene, toluene, etc.); from the elements or compounds employed in carrying out the reactions (*e.g.*, chlorin, nitric acid, sulphuric acid, arseneous acid, sodium sulphid and sulphuretted hydrogen gas); from intermediate bodies formed (nitro and amido compounds, *e.g.*, nitro-benzol, dinitro-benzol, anilin) and, finally, from the end-products themselves (dyes).

The cases of poisoning by the fumes of tri-nitro-toluene (also known as T.N.T. and toluol, as well as triton or trotyl), reported in this paper, occurred in the manufacture of picric acid and benzol by the nitration of toluene. In this process both nitric and sulphuric acids are used. This manufacturing process was begun in Massachusetts late in the fall of 1915. The first case of poisoning reported occurred in November of that year.

Occupational illness in this group of cases is due chiefly to T.N.T. dust and to the escape of nitrous fumes evolved in the nitration and during the dilution of the T.N.T. waste acids, also from the chlorin and its compounds given off in the manufacturing process.

Symptoms may develop quickly, especially when there is exposure in confined space. These may be—

(1) Persistent cough due to no known cause;
(2) Unaccustomed shortness of breath;
(3) Fatigue, not explained by exertion;
(4) Pain coming on suddenly in legs and feet.

These symptoms may develop in degrees from temporary discomfort, relieved by going into the open air, to convulsions, paralysis and death.

The following cases, taken from the records of the State Board of Labor and Industries, bring out many of the various forms in which industrial T.N.T. poisoning may show itself:

Case 1. (Fatal.) A carpenter, 42 years of age, employed one week in an establishment where the nitrating of toluene was a part of the process of manufacture, was made dizzy from fumes escaping from a duct under which he was at work. A short stay in the open air revived him. Vertigo and dizziness returned when he remounted the staging. He went home and returned to work the next day. On reaching the working platform he was nauseated, vomited, became dizzy and had to be helped out into the open air. He drove two miles in an open car to his home, during which he was exposed to cold, damp November air. Seven hours later he suddenly grew worse, had convulsions, passed into coma and died at 11.45 p.m. Autopsy confirmed death by gas poisoning.

Case 2. (Fatal.) A man, 26 years of age, employed for three months on a nitrator of toluene, reported to the physician on November 4. His symptoms were pallor, dermatitis, general weakness, loss of weight, nausea, cough, palpitation, headache, vertigo, low hemoglobin count. Man left work and after two days' absence appeared to be perfectly well, when suddenly shortness of breath and symptoms of edema of the lungs developed. He died November 10. Death return given as pneumonia due to gas poisoning.

Case 3. (Fatal.) Man, 26 years of age, employed as a laborer about yard of a chemical works, where the nitrating of toluene was being done, on Saturday worked from 6.30 a.m. to 5 p.m.; did not work on Sunday; reported at 6.30 a.m. Monday and soon requested leave of absence on account of nausea, vertigo and loss of muscular power. Returned to his home at seven o'clock in the morning. Fellow workman visited him in the evening and noticed hallucinations, mental confusion, inability to talk coherently. Man was taken to the hospital, where he died at 11.30 p.m. the same day. Autopsy finding: death from tri-nitro-toluene gas.

Case 4. (Fatal.) Man, 43 years of age, employed as a guard about a plant nitrating toluene, was transferred to the nitrating department on February 15, 1916. On the following day, while cleaning the inside of the nitrating tank, he was frequently compelled to go out into the air for relief, because of nausea, dizziness and blurred vision. He worked from 10 a.m. until 2 p.m., walked about one mile to an electric car and rode five miles to his home. Early in the evening he was seized with vertigo, hallucinations, spasms, unconsciousness, and died at two o'clock in the morning. Autopsy findings: edema of lungs due to gas poisoning.

A marked characteristic of the foregoing cases was the delayed onset of fatal symptoms and the long interval of apparent good health between the time of poisoning and the onset of serious symptoms. This late manifestation of toxemia from benzene derivatives is a characteristic feature in this group of industrial poisoning. These cases also occurred in cold weather, during which there was much exposure after the onset of the first acute symptoms. Most authors emphasize the necessity of safeguarding against cold, men who have been exposed to gases and fumes. Of this group of poisons, each of the cases described showed the characteristic manifestations of red-cell destruction and, consequently, oxygen starvation, especially of the brain and nervous system. Post-mortem findings showed marked blood destruction and organic congestion.

The following non-fatal cases of T.N.T. poisoning are quite typical of this group:

Case 1. Man, 43 years of age, employed with a fellow workman (Case 3) in cleaning the inside of a nitrating tank, was overcome by fumes, rendering him unconscious. He was removed to the outer air and was resuscitated by artificial respiration with the use of a lung motor. He walked three miles for an electric car and rode seven miles to his home. He was apparently fully recovered from the "gassing." Next morning at two o'clock he was awakened suddenly with dyspnea, suffocation, chills, pain in left chest, dizziness and marked muscular prostration. He also had cyanosis and a thick, sticky, brownish expectoration, slight fever, cloudy urine, dark, sticky ejections, crepitant râles at base of both lungs. Diagnosis: edema of lungs. Made a slow recovery.

Case 2. Man, 30 years of age, had worked in T.N.T. department for six weeks. During past week had cough, irritation of throat and frequent attacks of nausea and dizziness. Had lost fourteen pounds in weight in six weeks. Found he was not able to do work as formerly, easily fatigued, much muscular weakness; face showed ashen hue. Transferred to outside work, fully recovered.

Case 3. Man, 24 years of age, an electrician, was sent to a chemical works to make repairs in T.N.T. department. After fifteen days' work he was reported as sallow, nauseated, general weakness, vomiting, cough, rapid pulse, headache, vertigo, unable to continue work because of general muscular weakness and constant recurrence of foregoing symptoms.

Case 4. Man, 26 years of age, employed one month as mixer in T.N.T. department, was "gassed" by escape from leaky pipes. Felt slight discomfort, transferred to outdoor work. Two days later was seized suddenly with vertigo, headache, nausea, vomiting, loss of power, cough; not able to continue work because of loss of muscular power.

Case 5. Man, 24 years of age, had been working about one month on T. N. T. nitrator; was suddenly overcome on way home when about half a mile from plant. Was unconscious for two days. Convulsions, muscular spasm, loss of power of legs were followed with some muscular wasting. He also had pallor, cyanosis, dyspnea, cough, pulse of 120, vertigo, mental confusion. Convalescence slow. Never fully recovered complete muscular power of legs.

Case 6. Man, 25 years of age, had worked six weeks as machinist about T.N.T. plant. Suddenly overcome by fumes from nitrating pot overflowing, remained unconscious four hours. Cyanosis, general weakness, dyspnea, pulse rate of 90. On recovering consciousness was troubled frequently with vertigo and marked loss of power of legs; not able to return to work.

Case 7. Man, 35 years of age, worked as a laborer about T. N. T. plant. At the end of three weeks reported with pallor, general weakness, loss of weight, pulse 90, "looks poorly," hemoglobin 70-80%, easily fatigued, much loss of muscular power; not able to continue work; left employment.

The State Board of Labor and Industries has furnished a set of rules and regulations for safety in the manufacture of benzene derivatives and explosives.* These rules provide that a "caution" notice be posted in a conspicuous place in all departments where any of the substances are used, setting forth the common name of the poisonous substance and that the substance named is capable of causing poisonous symptoms if precautions are not observed. This notice also sets forth the signs and symptoms of poisoning, viz.: throbbing of blood vessels, giddiness, dizziness, headache, weakness of legs, palpitation of heart, nausea, blueness, cyanosis and unconsciousness.

The first-aid treatment recommended is:

(*a*) Remove poisoned person to the fresh air. Keep him quiet and warm.

(*b*) Do not let person walk home until advised by physician.

(*c*) Use hot coffee as stimulant.

(*d*) If person is unconscious, apply artificial respiration; lungmotor; oxygen inhalation; keep patient warm.

PREVENTION.

(*a*) Avoid dust, fumes and chemical compounds on hands, feet and clothes.

(*b*) Wash hands before eating and after day's work is finished.

(*c*) Do not eat food nor chew tobacco in workroom.

(*d*) Do not wear same clothes in workroom and at home.

(*e*) Use extra protection on hands, feet and clothes while at work on any of the substances mentioned in these regulations.

(*f*) Bathe regularly.

(*g*) Consult a physician if losing color or weight.

(*h*) Do not enter stoves, vats or retorts for repair work unless in the presence of another workman.

(*i*) Have emergency appliances ready for use in all dangerous repair work.

(j) Watch for leaky joints in pipes, ducts, valves, etc., carrying the gas or chemical compounds.

SOME OBSERVATIONS ON THE BÁRANY TESTS AS APPLIED TO AVIATORS.

By H. L. Babcock, M.D., Boston.

[From the U. S. A. Aviation Station at the Massachusetts Charitable Eye and Ear Infirmary.]

Before beginning the recent nation-wide appeal for men to train for service as aviators, the authorities at Washington, realizing the necessity of sending into the air only men with normal equilibrium, incorporated into the already exacting physical examination, the so-called Bárány methods of examination of the semicircular canals. These tests determine the presence or absence of an intact and normally active static apparatus.

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* Copies may be procured at the office of the Board, 1 Beacon Street, Boston (Industrial Bulletin No. 11.)

This work was developed by Robert Bárány, a brilliant young otologist of the Vienna school, who, in 1914, was awarded the Nobel Prize for research in medicine. At the beginning of the European War, Bárány enlisted in the Austrian army, and the work was taken up by a small group of otologists in the Medical School of the University of Pennsylvania. Using Bárány's methods, supplemented by the work of the Spanish anatomist, Cajal, and the results of autopsy findings, this group of investigators has been able to bring the methods of examination to a point of marked diagnostic efficiency. The principle underlying them all is this: Movement of the endolymph in the semicircular canals in a given direction stimulates the sensitive hair cells in these canals, and produces definite phenomena. These phenomena are: 1, a twitching of the eyes, or nystagmus, of a certain type; 2, vertigo; 3, so-called "past-pointing"; 4, falling reactions. In a person to be examined, this endolymph is artificially set in motion, either by turning the subject in a smoothly revolving chair, or by douching the ear with hot or cold water. The complete technic of examination has been described in detail in a recent article by Jones and Fisher (*Annals of Otology, Rhinology, and Laryngology,* Vol. xxvi, No. 1) and will not be taken up here.

The tests used for the candidates for aviation are based on the turning reactions only,—the caloric and galvanic reactions being omitted entirely,—as the only object is to determine the integrity of the labyrinth and its tracts, and not for differential diagnosis.

It has been the duty of the writer during the past five months to examine over one thousand candidates by these methods, at the Boston examining station in the Massachusetts Charitable Eye and Ear Infirmary. The chair used is the American modification of the Bárány chair, with two head rests, a foot rest, and a stop pedal. Some facts of interest have been brought to light. The examination adopted for this work is as follows:—

Equilibrium (vestibular). Head tilted forward 30°. Eyes closed. Rotation nystagmus normal 26 seconds, a variation of 10 seconds allowable.

(*a*) *Right:* Applicant to be turned toward his right, 10 turns in exactly 20 seconds, horizontal nystagmus to left for ...... seconds. *Left:* Applicant to be turned toward his left, 10 turns in exactly 20 seconds, horizontal nystagums to right for ...... seconds.

(*b*) *Pointing tests:*

1. Before turning. Right arm ......, left arm ....
2. After turning 10 times in 10 seconds to right. Right arm ...... left arm ......
3. After turning 10 times in 10 seconds to left. Right arm ......, left arm ......

(*c*) *Falling tests:*

1. Turn to right, 5 turns in 10 seconds. Falls to ......
2. Turn to left, 5 turns in 10 seconds. Falls to ......

(*a*) *Nystagmus.* The patient is seated in the chair with head upright, but tilted 30 degrees forward and pressed back firmly against the head rest. Tilting the head forward 30 degrees brings the external semicircular canal exactly in the horizontal plane, and is, therefore, the canal to be stimulated when the candidate is revolved in a horizontal plane. With his eyes closed, he is then turned to the right ten times in twenty seconds. The chair is then suddenly stopped and the candidate told to open his eyes and look straight ahead at some distant point. There should occur a horizontal nystagmus to the left of 26 seconds' duration. The nystagmus is horizontal because nystagmus is always in the plane of the canal stimulated. The movement in this instance is a slow pull of the eyeball to the right, followed by a quick return to the left; the latter being the most noticeable, the entire reaction is called nystagmus to the left. As a matter of fact, the vestibular stimulation has to do only with the slow component, the quick component being "cerebral" and not "brain stem." This has been demonstrated by turning a normal individual under ether and observing only a conjugate deviation in the direction of turning, the eyes always being drawn in the direction of the endolymph movement. The nystagmus, then, is in reality a battle between the purely reflex stimulation from endolymph motion to the eye-muscle nuclei in the pons, and the cerebral attempt to cut down the pull and restore the eyes to their normal position. The duration of this battle varies considerably. While 26 seconds has been found to be a normal average duration, a liberal variation of ten seconds either way is allowable. The rate of movement also varies greatly. In the candidates examined this rate has varied from a movement so rapid and fine as to be almost imperceptible, to a movement of very large amplitude and at a rate of hardly more than one double movement per second. The average, as observed, has been at the rate of 30 to 45 double movements for the first fifteen seconds. The duration of nystagmus is measured by a stop watch. In a similar manner the candidate is turned to the left, although this is practically unnecessary, provided the first turning gave a normal reaction. This is because the reaction following turning to the right is furnished by both horizontal canals combined—one-third from the right and two-thirds from the left (the explanation being that movement of endolymph toward the ampulla gives a stronger reaction than movement away from it). The nystagmus persists a few seconds longer than the vertigo.

(*b*) *Pointing Tests.* These tests are not reflex acts, and require honest and intelligent coöperation between candidate and examiner for their execution. Happily, the applicants for air service have thus far been of sufficiently high grade to render this coöperation easily obtainable. The candidate, sitting in the chair, facing the examiner, closes his eyes and touches the examiner's finger, which is held in front of him. He next raises his arm to a perpendicular position, then lowers the arm, and attempts to find the examiner's finger—first with the right arm, then with the left. The normal individual is always able to find the finger. After turning the candidate to the right ten times in ten seconds, this test is repeated. During the last turn the stop pedal is released in order to lock the chair as it comes into position. This prevents any movement of the chair during the tests, which might offset the past-pointing. By past-pointing is meant the deviation of the candidate's finger to the right or left as he tries to locate that of the examiner. The right arm is tested, then the left, then the right, etc., until he ceases to past-point. In this instance the normal individual will past-point at least three times to the right with each arm. The eyes are kept closed throughout the test. The phenomenon of past-pointing is the result in this case of experimentally produced vertigo. Vertigo is always in the plane of the canal stimulated (in this case, the horizontal), and is always in the direction opposite turning because of the changed relationship of the endolymph movement to body movement, the instant the chair is brought to a sudden stop. This being the case, the candidate feels that he is rapidly turning to the left, while in reality he is sitting motionless. Hence he feels that he is going away from the examiner's finger, and in his effort to come back to it, he past-points to the right. The test is then repeated, turning to the left. At the Boston station the Bárány chair, unfortunately, is in the large room in which the applicants wait. This enables them to familiarize themselves somewhat with the pointing tests and oftentimes clouds the purely sensory reaction desired. In the cases where the candidate overcomes his vertigo and swings in the wrong direction, the writer has observed that failing to touch the desired object, the arm will then swing back in the normal direction. A great variation in the extent of past-pointing has been noted, some men swinging out ninety degrees, while others deviate only a few inches from the examiner's fingers. Also the outward pointing arm almost invariably swings wider than the inward. These variations are probably due to differing degrees of muscular control. If, however, the pointing tests are questionable, the vertigo is measured quantitatively in the following manner: The candidate is turned, with eyes closed, to the right at a uniform speed, and is asked to keep on telling the examiner in what direction he is being turned. Thus he keeps on saying, "to the right, to the right." After ten turns in ten seconds the chair is stopped and immediately he will say, "I am going to the left." The stop watch is started the same instant and kept running as long as the patient thinks he is going to the left. When he says, "I am standing still," the stop watch is stopped and the reading of the duration of the vertigo taken in seconds. In a normal case the duration of the vertigo is approximately twenty-four seconds. The test is performed in a similar way by turning the patient to the left. This test depends on the same physiological stimuli as does the pointing test.

(*c*) *Falling.* The candidate's head is inclined ninety degrees forward and held in place by a head rest. The eyes are closed. He is then turned to the right five times in ten seconds. On stopping, the candidate raises his head and should fall to the right. In placing the head ninety degrees forward, the vertical canals are then in a horizontal plane, and therefore, the endolymph in those canals is set in motion when the chair is rotated. As long as the head is kept in that position the vertigo remains horizontal, but on raising the head to an upright position the vertigo at once becomes vertical (in this case to the left because the endolymph movement was to the right) and the candidate, having the sensation of falling to the left, throws himself to the right in order to correct his supposed abnormal position. The test is then repeated, turning to the left. Great variation, within normal limits, has been noted in connection with this test. Some men entirely lose control of themselves, and would fall from the chair if not supported by the examiner. In others only the slightest sway to the right or left can be directed as the head is raised. Here again voluntary muscular control is a large factor. Occasionally a man will raise his head with no lateral movement whatever, and hold it so for several seconds, when on slightly relaxing his body, the sway will become apparent.

It is a well-known fact that stimulation of sensory nerve-endings may affect the pulse rate. The following is a summary of pulse-rate findings taken immediately before and after turning, on one hundred cases taken at random among the candidates examined:

Average pulse rate per minute before turning	78
Average pulse rate per minute after turning.	87
Average pulse increase per minute..........	9
Lowest pulse rate per minute before turning	58
Highest pulse rate per minute before turning	108
Lowest pulse rate per minute after turning..	60
Highest pulse rate per minute after turning	124

In 80 cases the pulse rate increased after turning.
In 12 cases there was no change.
In 8 cases the pulse was lower after turning.
The greatest increase was from 80 to 116, or 36.
The greatest decrease was from 76 to 66, or 10.

These findings cover a wide range of variation. Taking the general averages, it can be said that in one hundred cases the stimulation to the vestibular portion of the eighth cranial nerve end-organ by fifty revolutions, at varying rates of speed, produced an increase in the rate of heart action of nine beats per minute. Taking the cases separately, they may mean little or nothing. The responsiveness of the pulse rate to mental conditions probably accounts for the eight cases which showed a lowered rate after turning, due to the fact that some of the men approach these tests with considerable apprehension.

A still more interesting and valuable investigation has been suggested by Dr. C. J. Blake,—that of determining the length of time necessary for the organism to regain its normal control of the heart action. Lack of time has made this study impossible.

In a very few cases, an active reflex with the tenth cranial nerve has caused vomiting, especially after stimulation of the vertical canals. In no case has the candidate fainted, although when it is anticipated, he is strapped in the chair.

The writer believes that, by demonstrating an actively normal organ of equilibrium in every prospective aviator, this Government will avoid many costly accidents in the air which otherwise would be unavoidable.

This work is a part of the examination conducted at the Massachusetts Charitable Eye and Ear Infirmary through the kindness of its trustees. The personnel of the physical examining unit consists of Capt. H. P. Cahill, Lieut. J. G. Jennings, Assistants W. J. Harkins, W. I. Wiggin, G. H. Poirier, H. L. Babcock, Mrs. Edward Irwin and Mrs. D. E. Woodbridge.

A STUDY OF SOME PERCENTAGE SOLUTIONS.*

By Theodore J. Bradley, Boston,
Massachusetts College of Pharmacy.

In general, it is impossible to prepare a predetermined volume of a solution of a definite percentage strength, as we cannot know the specific gravity of the solution before it is made. Nevertheless, such solutions are frequently prescribed, and this paper is a report on a study of the problem of preparing them so as to approximate closely the required strength and volume.

Assuming that he knows that percentage solution means that the given number of parts by weight of the chemical are contained in 100 parts by weight of the solution, the thoughtless dispenser who has a call for a fluid ounce of a percentage solution will most often calculate the required percentage of 480 grains, assuming that this is the weight of the finished solution, which is seldom the case. A more careful worker will calculate the required percentage of 455, or thereabouts, assuming that the finished solution weighs the same as one fluid ounce of water, which is seldom quite true. Either of these men will weigh the calculated amount of the chemical, introduce it into a graduate or an ounce bottle and add sufficient of the solvent to make one fluid ounce.

Remembering that it is practically impossible to make an absolutely accurate solution of any strength, these methods are sufficiently accurate for weak solutions, say up to 5% strength, perhaps even up to 10% strength, but such methods will not do for strong solutions the specific gravities of which are markedly greater than that of water. In various parts of the country, strong solutions of silver nitrate, argyrol, potassium iodide and other chemicals are frequently prescribed, and the druggist who is asked for a 50% solution, and weighs 240 grains of a chemical, adding enough water to make a fluid ounce, will dispense a solution of about 35% strength. If the physician calls for a percentage solution, it is not safe or wise to assume that he means a 50 weight to volume solution, as in the foregoing examples.

It is entirely correct to dispense percentage solutions entirely by weight, but this is contrary to American custom, and not many pharmacists will do it.

An indefinite volume of a correct percentage solution can be made by dissolving as many parts of the chemical as the percentage required in sufficient water to make 100 parts by weight of the solution, and this method can be used to prepare a volume greater than any given number of fluid ounces, as in the following example:

To dispense 2 fluid ounces of a 25% solution of silver nitrate.
100 — 25=75 parts of water in 100 parts of the solution.
455×2=910 grains, weight of two fluid ounces of water.
75 : 25=910 : x=303 grains, weight of silver nitrate to be added to 2 fluid ounces of water.
(Notice that 2 fluid ounces of water are to be used; *not* enough water to make 2 fluid ounces.)

While this method is accurate, it is wasteful, as the surplus is generally thrown away, or it is impracticable in requiring the preparation of unstable stock solutions.

In studying this question percentage solutions of quinine bisulphate, an alkaloid of average density, and of silver nitrate, a heavy chemical, were made and their specific gravities taken. From the results the following tables were constructed:

Percentage Solutions of Quinine Bisulphate.

Strength	Specific Gravity at 25° C.	Weight of 1 Fl. Oz. at 25° C. in Grains.	Grains of Salt in 1 Fl. Oz.
0%	1.000	454.6	0.0
1%	1.003	456.0	4.6
2%	1.006	457.3	9.1
3%	1.008	458.2	13.7
4%	1.010	459.1	18.4
5%	1.013	460.5	23.0
6%	1.016	461.9	27.7
8%	1.021	464.1	37.1
10%	1.026	466.4	46.6

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* A paper presented at the 1917 meeting of the American Pharmaceutical Association

PERCENTAGE SOLUTIONS OF SILVER NITRATE.

STRENGTH	SPECIFIC GRAVITY AT 25° C.	WEIGHT OF 1 FL. OZ. AT 25° C. IN GRAINS	GRAINS OF SILVER NITRATE IN 1 FL. OZ
0%	1.000	454.6	0.0
1%	1.009	458.7	4.6
2%	1.017	462.0	9.2
3%	1.025	466.0	14.0
4%	1.034	470.0	18.8
5%	1.043	474.1	23.7
6%	1.052	478.2	28.7
8%	1.071	486.9	39.0
10%	1.096	498.2	49.8
12%	1.128	512.8	61.5
15%	1.162	528.2	79.2
20%	1.216	552.8	110.6
25%	1.276	580.1	145.0
50%	1.688	768.4	393.2

An examination of these tables will show that the common methods of dispensing are approximately correct for both solutions up to about 5%, and for the alkaloidal solution up to about 10%, but that solutions made by such methods are grossly inaccurate for strong solutions of heavy chemicals. The last column of the second table can be used for preparing percentage solutions of silver nitrate, multiplying the quantity for any required number of fluid ounces, and adding sufficient distilled water to make the required volume.

This is only a preliminary paper on the subject, and it is the writer's intention to extend the tables to include other chemicals prescribed in percentage solutions, and to endeavor to calculate average weights per fluid ounce for solutions of different strengths and of different chemicals. Suggestions for chemicals to be included will be gratefully received.

Book Reviews.

An Original Hypothesis of the Origin of Life. By MRS. M. A. MOORE-BENTLEY. Published by Author. 1917. Selling Agent, J. L. Hammett and Company, Boston.

This book of about two hundred pages is an annunciation of a new hypothesis of the origin of life and the evolution of intellect. The author claims absolute originality of idea, if not theory, and disputes many of the theories of the evolution of life and the evolution of intellect. Her ideas are presented in fifteen chapters, illustrated by forty-five original drawings.

The Practical Medicine Series. Vol. 3. The Eye, Ear, Nose and Throat. Edited by CASEY A. WOOD, C.M., M.D., D.C.L.; ALBERT H. ANDREWS, M.D.; GEORGE E. SHAMBAUGH, M.D.

This book of 372 pages is one of a series of ten, covering the field of medicine and surgery. This volume is on the eye, ear, and throat, and gives the progress in these branches for a year. This number has a good deal bearing on the military surgery of the eye, and covers the work on eye, ear, nose and throat for the year 1916.

The Baby's Food. By ISAAC A. ABT, M.D., Professor of Diseases of Children in the Northwestern University Medical School, Chicago. 12mo of 143 pages. Philadelphia and London. W. B. Saunders Company. 1917.

This little book is simply a collection of very careful recipes for the preparation of the foods most commonly used for babies and young children. The directions given are most minute and very plain. We know of no other book exactly like it. It should prove most valuable to mothers, nurses and physicians.

The Surgical Clinics of Chicago. June, 1917. Vol. I, No. 3. With illustrations. Published bi-monthly. Philadelphia and London: W. B. Saunders Company.

The contributors to the Surgical Clinics of Chicago for June are Drs. E. Wyllys Andrews, Carl Beck, Frederic A. Besley, Arthur Dean Bevan, James T. Case, Carey Culbertson, Arthur H. Curtis, Vernon C. David, Carl Braden Davis, George G. Davis, Daniel N. Eisendrath, Albert Edward Halstead, N. Sproat Heaney, Lewis L. McArthur, Albert J. Ochsner, Charles Aubrey Parker, Nelson Mortimer Percy, D. B. Phemister, John Lincoln Porter, Kellogg Speed and Thomas J. Watkins.

There are twenty-five monographs of varying length.

The article by Bevan, upon esophageal diverticulum, is the best brief statement of this condition and its treatment, that we have seen. He writes also an excellent chapter upon diaphragmatic hernia.

Wyllys Andrews describes his method of operative relief for varicocele in a brief and well-illustrated chapter; and Halstead outlines an interesting technic in the operative treatment of hydrocephalus. Phemister tells of a simple and effective method of reconstructing the hepatic duct. The other articles are well worth reading. Vol. No. 3 compares favorably with its predecessors.

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Ernest Gregory, *Manager,*
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A BROADER CONCEPTION OF INSANITY.

Perhaps nowhere is the line between health and disease so difficult to draw as in diseases of the mind. A great deal of this difficulty lies purely in the lack of knowledge on the whole subject. More of it is due to the fact that although there may be very patent mental disturbances, even following definite diagnostic requirements, the disturbance is not sufficient to make the individual a menace or a burden to society. One must hesitate on any other grounds to make a clear-cut diagnosis of insanity. Yet clinically the diagnosis of insanity can be made with less hurt to the conscience than otherwise, because very often clinical diagnoses, in so far as the mind is concerned, are merely academic expressions. The serious side of this question, however, arises in law. The law lays down certain requirements before it will absolve an insane person from responsibility for his act, and these are the requirements that the psychiatrist must reconcile with his own. The "rule in McNaughton's case" is still law at the present time,—that to be free from responsibility an individual must not "know the nature and the quality of the act he was doing, or if he did know it, he did not know that he was doing what was wrong." Medicine inclines to hold that once the fact of an insanity is established the individual is no longer responsible. Aside from philosophic considerations of human responsibility, there is no doubt that there cannot exist in the body any pathological change without influencing the whole body and the action of that body. Yet this same influence must logically apply to somatic disease as to mental. There is no doubt that the rule in McNaughton's case applies in every classic mental disease where an individual must be held under restraint for his own or for society's sake. Nevertheless, it must be conceded that there are many distinctly insane who never run counter to society, perhaps from lack of provocation or because the restraining influence of their environment or previous training and education is stronger than the compulsion of their mental disturbance. And without overt action or burden, definite statements of insanity are unscientific dogma until, at least, more is known on the subject. There is quite as much difference of opinion as to the presence of tuberculosis, heart disease, etc., in a certain individual as of insanity, yet these very diseases do not always incapacitate an individual, nor even necessarily render his efficiency less, any more than they do in mental disease. There are many individuals, for example, who conform to all the earmarks of melancholia—the so-called "glooms"—who get on very well in society, although an examination by any psychiatrist might pronounce them distinctly psychopathic. They are not practically insane as long as they take their own place in society, are not a burden on it, and contribute a little to the common welfare. The same may be said of certain manic types. They always live in a certain heightened mental state, always voluble, excited and elated. They are real manics. They might be under restraint except for the degree, for the evenness of their condition and for the fact that they are perhaps never really sufficiently crossed to bring an unusual outbreak. Very often they are the clowns, the entertainers and the like, and general favorites. The laity recognize them merely as types, and they get along in their own way—

as does nearly every one else. Some of the geniuses of society may perhaps be found among them. Indeed, if we are looking for mere symptoms of insanity, there are many credited to the insane that are in full bloom in those considered normal. In order to make out insanity from symptoms it is the *ensemble* in action that constitutes it. People with depressions, fears, excitations, notions, etc., are met with in all walks of life. The laity call them queer or peculiar—and that is perhaps the worst that can really be said of them. It is true that many of them need only sufficient provocation to change them from potentials to actuals.

When we pass from symptoms of insanity to actual insanities, such as dementia precox, paranoia, etc., we find the same difficulty of determination. Not all cases of dementia precox are unable to take care of themselves. They may fill many positions of trust and responsibility. The disease may be so mild in them or the progress so slow that a lifetime is too short to bring the disease out fully. Because of the wealth of their imagination, colossal egotism, and so-called "push" they may reach advanced positions,—positions to which one with more balance, poise and restraint could not attain. With many paranoiacs the specific delusion and associated symptoms may never be more than mere hobby, and certainly not more harmful. Provocation for overt action may be so mild as never to merit resentment, and therefore give no cause for interference.

It does not follow, because a person is found, perhaps quite by chance, to be basically insane, that he is as a result to be outlawed from normal society, even though that form of insanity from which he suffers is permanent and progressive, any more than if he had some permanent progressive organic disease, but not severe enough to render him unfit to take his place in society. The clinical diagnosis of insanity must always be made guardedly, otherwise perhaps not at all. What will do on scientific grounds will not answer practically. The disrepute into which some alienists have fallen is due to failure to differentiate between actual dynamic insanity and actual although only potential as far as overt action goes. Perhaps the legal and the medical profession would be less at loggerheads over this question if they both recognized that there are so many individuals who are either above or below the standards laid down for normal people, but yet not really abnormal, that no hard and fast rule can be applied. It is hard to say with how much actual responsibility an individual who is not actually normal is to be credited. The responsibility for an act is not fixed in any one. It must vary with mental capacity, temperament, environment, education, etc. In legal determinations it were better to take this stand than to try to carve out responsibility from the always vague symptoms that most individuals under suspicion present. Sanity at best is only relative, not only as to the patient, but as to the examiner himself It is just as relative as are disease and health in general.

THE SIGNIFICANCE OF TUBERCULAR SIGNS IN MILITARY LIFE.

THE orthodox views held during ordinary times on the significance of physical signs in the chest have undergone much change in the minds of some observers, in view of the extraordinary behavior of tubercular individuals while in the military service. The auscultatory signs that previously singled out an individual as tubercular and enforced upon him the most rigid regimen are no longer given the same weight as regards the availability of such individuals for military life. It would seem that the whole fabric of the art of physical diagnosis, developed to such degree in order to discover incipient pulmonary tuberculosis long before the stage of tangible symptoms, and at a period when the chances for cure are hopeful, is given little credence by some of the European military medical men. Fishberg (*Jour. Amer. Med. Assn.*, June 16, 1917) joined these foreign observers in nullifying the significance of physical signs, unless associated with symptoms, as indices of pulmonary tuberculosis. If this view becomes the abiding one in civil as well as military diagnosis, the whole art of physical diagnosis as applied to the lungs must undergo radical revision. It is true that many of the physical signs associated almost entirely with tuberculosis are really of non-specific origin. Yet it is very much of a question whether any pulmonary lesion that gives these physical signs, no matter what the exciting agent or organism, had better not cause the individual to be put under the same strict regimen as those who have undoubted symptoms of tuberculosis. The experience of the European medical officers has been that unless an individual has symptoms—temperature and unstable pulse on slight exertion—as well as signs, he can do as well under a military regimen as those without signs suspicious of pulmonary involvement. Indeed, they maintain that camp life may cure many of these incipients or suspects. Certainly the rigors of military life are not more severe than many of the conditions obtaining in industrial life. There are histories of many English, French, German and Italian cases that were sanatorium patients before the war, and yet who weathered the strict military life without detriment to their health. Osler thinks that the development of tuberculosis during the war has been less than during peace times. This is particularly noteworthy because only the most cursory care could be exercised in excluding the unfit, and one would expect, therefore, much more breaking down than at other times. On the other hand, Osler's figures for this disease in the military service are somewhat to be modified by the fact that the very magnitude of illness and casualty, with the shortage of medical officers, would tend to make much of the morbidity from actual tuberculosis overlooked as such. But, on the contrary, it is quite likely that, at least in so far as initial infection among troops goes, there is very little of it because tuberculosis is really an infection of childhood, the adult infections being really reactivations of dormant tuberculosis contracted in early life. Adult non-infected soldiers are not likely to be infected by a tubercular soldier who managed to slip by the examiner. When the large number of cases of tuberculosis among French troops, placed at over one hundred thousand, and credited to carelessness in examination at a time of emergency, is analyzed, it will be seen that the percentage is actually lower than that during ordinary times.

The belief that adults are not likely to be infected, even from very active cases, unless they have a dormant lesion within themselves dating from childhood, makes necessary a revision of the whole idea of the campaign against tuberculosis—and perhaps these observations on tuberculosis may be one of the many good things arising from an evil. If the force of this campaign can be directed entirely against the infection in childhood, the work will be very much limited and simplified. The whole idea is plausible when it is remembered that the morbidity from some forms of tuberculosis in children is as high as 65%. The limitation of infection in childhood would almost solve the question of tuberculosis in adults, and so generally. The older the individual, the less desirable are his tissues as media for the development of the tubercle bacilli.

On the other hand, these views regarding military tuberculosis are rather radical, if not somewhat premature. It is too early for any observations to revise our whole conception of the physical signs of tuberculosis, and of the significance of this disease with respect to certain activities. Judgment on this whole subject is better reserved until a later period, with many other judgments growing out of present conditions. There is no doubt that in a military emergency much good material is excluded by rejecting all who have signs suspicious of tuberculosis, or because they have been patients in sanatoria. This applies to the exclusion of individuals for other physical defects. Instead of admitting or excluding all who are not absolute on first blush, it would be more in keeping with the selective attitude of our military mobilization to find military employment suitable for every one presented. There is no one for whom a niche of usefulness cannot be found. Those who are otherwise rejected could be made useful to themselves as well as to the service, and, besides, they would be where they could be under observation to determine adverse effects should they arise.

◆

SPINAL SEROLOGY.

The importance of the examination of the spinal fluid in diseases of the mind and of the nervous system has been much emphasized of late by the specific spinal findings in such diseases as acute and chronic cerebrospinal affections, parasyphilitic cerebral and spinal conditions, and in tumors of the central nervous system. In the parasyphilitic affections, the blood reaction—the Wassermann—may be negative, and yet the examination of the spinal fluid for the presence of globulin and increase cell content will demonstrate the syphilitic origin of the condition. Dependence on the Wassermann reaction alone would have left the belief that one was not dealing with syphilis. In these late evidences of syphilis of the central nervous system, the infective organism has left the general circulation to become confined within the nervous tissues, and unless the examinations are likewise carried to that system through the examination of the spinal fluid, the correct etiology will remain undiscovered. Intensive study of the spinal fluid by Froin, Nonne, Elsberg and others has brought to light some very interesting spinal fluid findings in other diseases and tumors of the nervous system, of non-specific origin. These findings have been of assistance, not only in the general diagnosis, but as well in differential diagnosis, and have besides been valuable in indicating the advisability of operative intervention.

The elements in the spinal fluid around which these studies have been conducted are the color, the dissolved hemoglobin, the cell content, the globulin content and the coagulability. Normally, the spinal fluid is clear white, and any discoloration or turbidity must arouse suspicion of disease. Turbidity always suggests acute pyogenic infection. Blood suggests the same thing,—hemorrhage from traumatic or other origin, or intramedullary growth. But more particularly, a yellow coloration of the spinal fluid—xanthochromia—was found almost certainly to accompany spinal cord tumor of the lower lumbar or dorsal region. When the yellow color is due to dissolved hemoglobin, and gives the color tests for that substance, and the spinal fluid does not coagulate spontaneously, and, besides, contains very little globulin, the condition is undoubtedly an accompaniment of brain tumor in contact with the ventricles or the meninges. These latter conditions are, however, comparatively rare and do not exemplify the diagnostic significance of the yellow coloration and the allied spinal findings. The more important conditions in which yellow discoloration is found are in the sarcomata and endotheliomata of the conus and the roots of the cauda equina. Accompanying the xanthochromia, is the whole so-called Froin's syndrome, in which there is a clear, transparent yellow spinal fluid, giving no test for hemoglobin, which coagulates spontaneously, and contains an excess of globulin, as well as pleocytosis. An excess of globulin without an increase of the cell count—the so-called Nonne's syndrome—is characteristic of tumors of other levels. But a combination of the important features of both—yellowness, slight or no increase of the cell content, and an increase of the globulin—is characteristic of extramedullary tumor.

Spontaneous clotting of the spinal fluid is observed in acute spinal disease and in acute trauma with intradural hemorrhage. It occurs infrequently in extramedullary growths, but is most common in tumors of the conus and the cauda equina. It is rare in chronic spinal diseases. Increased globulin content is found in many organic spinal diseases. Nearly all spinal tumors have it, especially the extramedullary ones, but it is comparatively rare in chronic pachymeningitis, although it would be expected in chronic inflammatory conditions. The differentiation of extramedullary from intramedullary growths may be made from the cell count. Elsberg and Rochfort found that in the extramedullary growths the highest number of cells to the cubic millimeter was 8, while in the intramedullary ones it was as high as 26. The cell count here would be an important indication for or against operation according as it located the tumor. Moreover, sclerotic conditions of the spinal cord never show an increase in globulin, and hence the presence of globulin in increased quantities would point to tumor of some kind. In neuritis of the cauda equina there is neither an increase in globulin nor in the cell content, and it serves to distinguish this condition from tumor in that region.

Although these spinal findings are of vast help, the development of this diagnostic feature in spinal conditions is still too young to place too much dependence on it. These findings must not be taken as absolute, but rather as highly specialized aids to the usual clinical, laboratory, and other diagnostic methods. While the technic of these findings is for the trained serologist only, every clinician should be conversant with the meaning of the various pictures presented, in order to be able to understand the development and the progress of this part of the medical sciences.

* * *

MEDICAL PREPAREDNESS.

THE problem of medical preparedness in this country may be divided into three parts: (1) the Medical Reserve Corps, (2) the general activities of the National Red Cross, and (3) the special activities of the Red Cross in securing the required number of trained women nurses.

Granting that we have a sufficient number in the Medical Reserve Corps for the needs of the present army of 1,000,000 men, we know that this number is deficient in medical men under the age of thirty-five and deficient in men with certain special training,—for example, orthopedic surgeons.

In addition to this, the probabilities are that the medical profession of this country must furnish its quota for the second and perhaps the third million of men.

Granting that 10,000 medical men is the quota for 1,000,000 men on the firing line, this number of doctors will have to be increased as the reserves are called upon to take the places of the casualty lists. In addition to this, we know that our allies—England, France, Italy and Russia—will require from us a large number of trained physicians and surgeons.

If we desire to meet the medical situation with efficiency, we should prepare ourselves to select from the medical profession in the United States at least 45,000.

At the present time there are about 14,000 physicians commissioned and 7000 in the process of being commissioned. Twenty-one thousand medical officers are about sufficient for an army of 2,000,000. The indications are that we shall need a much larger army, and the medical profession of this country will be tested to its utmost capacity.

At a recent meeting in Chicago of the States Committees of the National Council of Defense it was decided to petition Congress to create a Reserve Medical Officers' Reserve Corps. When this is created, every qualified physician at any age will be given the opportunity and honor to volunteer his services and will be enrolled. After this every physician will be in a position either to wear the insignia of honor of the Reserve Medical Officers' Reserve Corps or the uniform of active service in the Medical Officers' Reserve Corps. From the new Reserve Medical Officers' Reserve Corps the Surgeon-General will be able to select medical officers as they are required for service in France or at home.

The present great problems are: the training of physicians in civil practice for military duty; the protection of the army in training in this country from venereal infection. The future great problem, when our wounded begin to return to this country, will be the reconstruction and reëducation of the crippled soldiers.

DEATH OF DR. HOWE.

The account of the death of Dr. George P. Howe, which was published in the Journal of November 15, was incorrect in one particular—that of stating that Dr. Howe was not in the Medical Reserve Corps of the United States. Dr. Howe went to Plattsburg for a month during the summer of 1916, and would have liked to try for a commission in the line. His nearsightedness made that impossible, but he did try for the Medical Reserve Corps and received his commission as First Lieutenant about the last of April, 1917. He at once volunteered for immediate duty in France and sailed May 19. When he reached England he found he was to be assigned for British service, and for this reason met his death under the British and not the American flag. He was a very ardent patriot, and when this country entered the war, he felt it keenly his duty to go.

THE HALIFAX CATASTROPHE.

The terrific catastrophe which overwhelmed the city of Halifax has evoked the instant sympathy and assistance of America. Almost immediately from New York and from the New England states and larger cities parties of physicians and relief supplies were sent to the scene of disaster. Two medical units were sent from Boston with the equipment originally prepared for the Peter Bent Brigham Base Hospital Unit, besides a large amount of Red Cross material. In next week's issue of the Journal will be published a full account of the personnel and activities of the body of Boston and other Massachusetts physicians who carried out the share of the medical profession in the great work of relief at Halifax.

MEDICAL NOTES.

Affiliation of Medical Schools.—Bennett Medical College and the Chicago College of Medicine and Surgery are now combined to form the medical department of Loyola University of Chicago. The purchase of the buildings and equipment of the Chicago College was made recently by Loyola University officials. Dr. Lawrence Ryan is dean of the new faculty of the school, Dr. Alfred de Roulet is junior dean, Dr. G. E. Wyneken is secretary, Rev. H. S.

Spalding, S.J., is regent. The college is on Lincoln Street, opposite Cook County Hospital, in the medical center of the West. The institution comprises five buildings.

Hospital Fire.—The Hotel Dieu Hospital of St. Hyacinthe, Quebec, was destroyed by fire on November 28. There were about 1000 inmates of the hospital, including aged persons and children, and all were removed to places of safety. The institution, managed by the Grey nuns, consisted of three stone buildings, erected at a cost of $600,000.

New Infirmary at Loomis Institute.—Loomis Institute, Windsor, Conn., is to erect a new infirmary, to be a memorial to Gwendolen Sedgwick Batchelder, who was wife of the head master of the Institute, Nathaniel H. Batchelder. The hospital will accommodate twenty patients.

WAR NOTES.

Health of French Army in Macedonia.—It is reported that the health of the French army in Macedonia has been better for the first nine months of this year than during the previous year. The typhoid admission rate was 1.38 per 1000, and that of dysentery 7.43. Malaria is still the most serious cause of disability, but even here there has been a notable decline. In August the rate was 23.8 in 1917, as compared with 39.16 in 1916, and in September it was 29 in 1917, as compared with 74.6 in 1916. The improvement is attributed to better sanitation, free distribution of mosquito nets, and to the practice of administering to each soldier a daily dose of quinine.

Appointment of Attleboro Physician.—Dr. Jerome J. McCaffrey of Attleboro has received his commission as first lieutenant in the Medical Department of the army, and will go at once to Fort Oglethorpe, Ga. Dr. McCaffrey graduated from Holy Cross College in 1911 and Harvard Medical School in 1915.

United States Hospital in Japan.—The American Red Cross has accepted the offer of St. Luke's International Hospital at Tokio, Japan, to use its establishment in case need arises for its use by the military or naval forces of the United States.

Death of Harvard Medical School Graduate.—Dr. Guy French Chandler, a recent graduate of Harvard Medical School, met his death in France from natural causes. He was the son of Dr. Allen Chandler of New York, and had been in ambulance service for the past eight months in France.

Death of Chief Surgeon.—Dr. Jacques Magnin, chief surgeon of the American Hospital at Neuilly, died suddenly on November 25

Return of Boston Physicians.—Dr. Eugene A. Crockett and Dr. Frederick T. Lord, the surgical and medical members of the American Red Cross Serbian Commission, have reached home after an absence of three months.

Health Conditions in Army Cantonments.—Pneumonia and measles are rampant at Camp Beauregard, near Alexandria, La. Lt.-Col. W. H. Schuffeler, sanitary inspector, reported about 1200 cases of measles, and that many cases of pneumonia have developed from the measles. There have been 22 deaths in three days.

At Fort Oglethorpe, Ga., about 240 cases of mumps and 80 cases of measles have occurred among the 30,000 soldiers. Nearly all those who have died of measles were from states where hookworm rate is high. Soldiers from these states are considered more likely to contract measles than those from other sections of the country.

Surgeon-General William C. Gorgas made a personal inspection of Camp Wheeler, Macon, Ga., where there were about 3000 cases of measles among the 22,000 Southerners at the Camp, and 300 cases of pneumonia with about 60 deaths from this disease during the past month. In reporting conditions found there, he stated that the tendency toward pneumonia undoubtedly was increased by the men being exposed to cold weather for a month in their summer clothing. About two-thirds of the 22,000 men now have been supplied with woolen garments, he said.

He believes the measles epidemic was due to the fact that men at Camp Wheeler were drawn from sparsely settled regions of the South where they had little opportunity to contract the disease when young. The pneumonia cases followed the measles, but the surgeon-general believes most of these were "contact cases," forecasting deaths unless prompt steps were taken.

He recommended that all men in the camp have 50 feet of floor space each, and that such additional shelter be supplied as may be necessary; that no fresh men be brought into the camp until the epidemic has subsided; that an observation camp be established, and that all new men be kept under observation until the main camp is free from infection.

These recommendations already are being carried out. The War Department announced that 1000 additional tents had already been shipped to the camp and the number of men for each tent reduced from nine to five. Woolen underwear reached the camp some time ago, and heavy outside clothing is being delivered as rapidly as railroad congestion will permit.

Casualty Report from General Pershing.—First Lieutenant Wallace Belfey, of Belvedere, Ill., in the Medical Officers' Reserve Corps, was seriously wounded in action. He was detailed for service with the British forces in

France. General Pershing also reported the death of ten soldiers, four of whom died of pneumonia, two of septicemia following wounds, and one of cerebrospinal meningitis.

Call for Nurses.—The Medical Department of the army has issued a call for 500 graduate nurses to serve in the Army Nurse Corps at base hospitals established at the National Army and National Guard cantonments. Each division has hospital accommodations for one thousand patients at the base hospital and will require sixty-five trained nurses, who will be paid $50 a month and maintenance. Applications should be addressed to the Superintendent, Army Nurse Corps, Mills Building, Washington, D. C.

War Relief Funds.—On December 8 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$302,426.67
Armenian-Syrian Fund	265,139.89
French Orphanage Fund	132,989.11
Polish Fund	91,631.73
Italian Fund	60,276.94

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Dec. 8, 1917, the number of deaths reported was 240, against 209 last year, with a rate of 16.20, against 14.33 last year. There were 36 deaths under one year of age, against 28 last year.

The number of cases of principal reportable diseases were: diphtheria, 151; scarlet fever, 31; measles, 73; whooping cough, 54; typhoid fever, 2; tuberculosis, 45.

Included in the above were the following cases of non-residents: diphtheria, 13; scarlet fever, 4; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 5; scarlet fever, 1; measles, 2; tuberculosis, 20.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 1.

Gift of Hospital to City of Malden.—Mr. and Mrs. Costello C. Converse have presented to the City of Malden the Colonel Harry E. Converse estate, to be used as a maternity ward. The estate includes a house of forty rooms, a stable, garage and grounds. The hospital trustees, in accepting the gift, voted to appropriate the sum of $8000 to make necessary changes.

Free Hospital for Women.—The forty-second annual report of the Free Hospital for Women, Brookline, recently published, states that 990 patients have been admitted to the hospital in the past year, and 1993 new patients have been treated in the out-patient department. There were 2326 operations performed.

Obituary.

SAMUEL PARKER COTTRELL, M.D.

Samuel Parker Cottrell, M.D., formerly of Boston, died at Newport, R. I., on the first day of December. Dr. Cottrell was born in Newport in 1861, and graduated from Jefferson Medical College, Philadelphia. In 1883 he went to St. Paul as professor of children's diseases in St. Paul's Medical College, and remained there until 1886. Two years later he removed to Boston. For six years he held the position of assistant surgeon at the Massachusetts Women's Hospital. He was lecturer at Tufts Medical College from 1894 to 1898, and also served as chief surgeon at the Boston Emergency Hospital. Upon the outbreak of the Spanish-American War Dr. Cottrell entered the Medical Corps of the army and was assigned to the United States General Hospital at Fortress Monroe, and later to duty in Cuba and the Philippines.

Dr. Cottrell was a member of the Newport Board of Health, was vice-president of the Antituberculosis Society of Newport, a member of the Rhode Island Medical Association, of the Massachusetts Medical Society, honorary member of the Rhode Island Dental Society, and a member of the American Medical Association. He is survived by two brothers and a sister.

THOMAS FREEMAN MOSES, M.D.

Dr. Thomas Freeman Moses, a Civil War veteran, died at his home in Waltham, Mass., on November 21. Dr. Moses was born in Bath, Me., on June 8, 1836, the son of William Vaughan Moses and Sarah Moses, and was a descendant of Elder Brewster, the Pilgrim. He was graduated from Bowdoin College in 1857, and received his degree of A.M. in 1860. He received his medical education at Jefferson Medical College in Philadelphia, and after his graduation in 1861, he went abroad for a year or more of study in Paris.

On his return to this country, Dr. Moses served in the Civil War as acting assistant surgeon, U. S. A. In 1870 he went to Urbana, Ohio, where he was first professor in the University of Urbana, and, from 1886 to 1894, was its president. He then retired from active work and made his home in Waltham, Mass.

Dr. Moses was a Fellow of the American Academy of Medicine and a member of the Geological Society of America, besides being a frequent contributor of papers to scientific societies. He is survived by his widow, four sons and a daughter.

Miscellany.

INFANT MORTALITY PREVENTION IN MASSACHUSETTS.

The Massachusetts Association of Boards of Health held its quarterly meeting on October 25, at Pittsfield, Mass. Dr. William J. Gallivan spoke on "Child Conservation in Time of War." He stated that statistics on infant mortality among the warring nations of Europe show a decrease in infant deaths of fifty per cent.

"It is estimated," said he, "that this great saving of young lives will, in one generation, balance the enormous losses caused by war, so that in twenty years those European nations which are conserving child life will be as strong numerically as they were at the outbreak of the war, notwithstanding the immense losses reported.

"Such an announcement stirs one's blood. American communities which for years have looked with complacency upon infant mortality rates in times of peace, four times as high as European nations are reporting in times of the world's greatest war, ought to be shamed into action. Always a pioneer in matters pertaining to health, Massachusetts, under the leadership of Dr. Allan J. McLaughlin, State Commissioner of Health, has undertaken the work of child conservation. The Commonwealth has been divided into eight health districts. Each district is presided over by a district health officer. To each district has been assigned a nurse, who will be assisted by a corps of volunteer aids. This machinery will be directed by a Committee on Conservation of Child Life, appointed by the State Commissioner of Health.

"It is planned to make a survey of every city and town, every village and hamlet in the State. This survey will include an exhaustive study of the mortality and morbidity statistics of children under the age of five years, the generally accepted period of school age, and a compilation of the agencies in each area which provide continuous, competent medical care. This survey will disclose the conditions. The remedy for the condition will be applied by the Committee on Child Conservation, who look upon local boards of health as their strong right arm in this venture.

"The work of the committee is well under way. In some cities and towns, the survey has been completed, and we are ready to go into these cities and towns and say: 'In this city last year 100 babies died. Of this number, 90 died of preventable disease. You have in this city a milk station where the feeding of infants can be supervised, but you have no facilities for expert obstetrical care, including prenatal care.'

"And so over every square foot of Massachusetts this survey will be made, the condition noted, the remedy recommended, and the solution carried into execution.

"The most important factors in child conservation are prenatal care, obstetrical care, and infant feeding. A recent report of the Children's Bureau at Washington states that 40% of infant deaths in this country occur during the first month of life.

"Such surveys as we are making in Massachusetts would undoubtedly disclose the fact that such deaths in large part were due to prenatal conditions, either medical, social or industrial. The minimum requirements for the proper conduct of an obstetrical case ought to be standardized by the State Department of Health. Cases which are unable to conform to the minimum requirements ought not to be cared for at home.

"Disorders of nutrition are responsible for the lion's share of infant mortality the world over. Everybody agrees that breast-fed babies never die of enteric disease. Therefore, breast-feeding should be universally encouraged by attending physicians. Bottle-fed babies do well only under constant supervision of competent medical men.

"The mortality rate of children from one year to 5 years is principally due to communicable disease and its sequelae. Proper enforcement of existing regulations for isolation would do much to lower this rate. Teeth and tonsils are recognized as important objects of inspection during this period.

"Coördination of existing agencies; elimination of overlapping, if any such exist; creation of new agencies where required; publicity of the widest kind to annihilate the superstitions and errors which have prevailed concerning the occurrence of illness; and the punch which an enthusiastic and expert central body can exercise, are the weapons relied upon to bring this work to a happy consummation."

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INFANT MORTALITY IN PANAMA CANAL ZONE.

Although it is difficult for white men accustomed to living in a temperate zone to adjust themselves to life in the tropics, a recent study made of infant mortality rates in the Panama Canal Zone demonstrates that infant life depends more on receiving proper care than on proper climate. A comparison of death rates in children under one year of age shows that the rate for the Panama Canal Zone is lower than that for the United States.

"The totals on the Isthmus, including military garrisons, show an average mortality for babies in the last seven years of 41.09 per 1000 births, while for the last comparable period in the whole United States the rate has been 10 deaths per 100 births. In other words, one child out of every ten born in the United States dies before reaching its first birthday, while in the Canal Zone only one American child out of twenty-five born fails to live to be a year old. Favorable as this showing is in comparison with the experience in the United States, it is even more so in its relation to the infant death rate in other countries. In Austria before the war, 180 children out of every 1000 born died before they were twelve months old, and in Germany, where the birth rate is slightly lower, yet where, it is presumed, the boasted science of living has been developed into a fine art, 147 babies die where every 1000 are born. The figures reach tragic proportions in Russia, where the death rate is 248. The only countries having as low as 100 are, in addition to the United States, Australia, 71; France, 78; and Sweden, 71. Besides these showings, which are chiefly of the years 1912-1914, the modest 38 to 41 of the Canal Zone stands out in shining distinction.

The significance of this saving in human life is explained by the conditions under which the Government makes it possible to exist and thrive on its own reservation. The reasons attributed by the Panama Canal record for the low infant death rate on the Isthmus may be summarized as follows:

1. Employees and their families in the Canal Zone are on a higher economic plane than the average family in the United States.

2. Treatment in the dispensaries and hospitals in the Canal Zone is readily available, and is furnished free or at a very low cost.

3. Most children are born in the hospitals, where both mother and child are under the care of experienced physicians and nurses during the critical period of the first week or ten days of the child's life.

4. Infants in the tropics escape the varying changes of temperature and season that those in the United States must pass through.

5. The mother in the Canal Zone has more time to devote to her offspring than the average mother in the United States. Many mothers there are obliged to work for wages to contribute to the family's income.

6. If artificial feeding is required, milk above the average obtainable in the United States is available. Proper milk formulas and free advice are given by competent physicians.

While the infant mortality rate among white American children is particularly low, the reverse is true among the native-born and West Indian children. The mortality rate among infants on the Isthmus under one year of age (taking all births reported for the Canal Zone and the cities of Panama and Colon) was 223.8 for 1915, and 216.8 for 1916. This was more than double the rate for the registration district in the United States for 1915, and higher than any foreign country from which we have statistics, with the exceptions of a rate of 248.0 for Russia in 1909, and 286.0 for Chile in 1914. The high death rate can be attributed to several causes, such as:

1. The majority of children are born at home, amid unhygienic surroundings, and often without proper care at time of birth.

2. Ignorance of mothers in the proper care of their children.

3. Malnutrition, etc., due to the low economic status of a large per cent. of the population.

4. The crowding together in tenement houses of many of the poorer classes, several persons often living and sleeping in one room.

While the birth rate per gross thousand population among the American population on the Isthmus is much lower than in the United States and foreign countries, this is readily accounted for by the relatively small number of American women on the Isthmus in proportion to the total American population. Particularly is this true among the military garrisons. The birth rate among the native-born and West Indian population, however, is almost double that of New York City, which is about 26 per thousand.

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AN EPISODE OF ROYAL OBSTETRICS.

In the issue of the *Lancet* for October 27, 1917, is published upon the authority of Dr. F. B. Clippingdale, the following vindication of the medical reputation of Dr. Sir Richard Croft, to whom great blame has undeservedly been attached for the death in childbirth of H. R. H. Princess Charlotte of Wales. An untoward event announced in the *London Gazette Extraordinary* at the time as a tragedy in the annals of English obstetrics:

"'Her Royal Highness the Princess Charlotte of Wales was delivered of a stillborn male child at nine o'clock last night, and about half-past twelve Her Royal Highness was seized with great difficulty of breathing, restlessness and exhaustion, which alarming symptoms increased till half past two o'clock this morning, when Her Royal Highness expired.'

"The Princess was in her twenty-first year. Her grandmother, Queen Charlotte, had been attended in her 13 confinements by a midwife, a Mrs. Draper, with the happiest results. When, however, the Princess Charlotte was known to be pregnant and an heir to the Throne anxiously desired, it was decided to take every possible precaution. Hers was the first Royal accouchement to be attended by male practitioners. Three were employed—Dr. Mathew Baillie, Dr. John Sims, and Sir Richard Croft. Of these, Sir Richard Croft was regarded as a specialist and controlled the case. Croft, although he appeared as a maternity specialist, apparently possessed no medical qualification. He was at Oxford for a short time, where Foster, in his 'Alumni Oxoniensis,' describes him as 'chirurgus privilegiatus,' but mentions no degree. He was not a Member of the Royal College of Physicians, was not upon the staff of any hospital, nor had he contributed anything to medical literature. He was, however, a man of high social position, and possibly his social position had something to do with his Court appointment. He inherited a baronetcy conferred upon his ancestor by Charles II. He married a twin daughter of Dr. Denman, the famous obstetrician (to whose practice he succeeded). Dr. Baillie, his colleague, married the other twin, so that there was a personal as well as a professional relationship between these gentlemen. The Court wished the Princess's confinement to take place at Kensington. The Princess, however, preferred Claremont, 15 miles away, and, at that time, not easily accessible. The labor was protracted and abnormal. There was hour-glass contraction of the uterus. The infant was known to be dead some hours before it was born, yet no steps were taken either to remove it or to terminate labor. The Princess was in an enfeebled condition from low diet, repeated bleedings, and unrelieved bowels. Finally there was post-partum hemorrhage. A Mr. Jesse Foot demanded a public inquiry, stating, upon the report of the nurse, that when the infant was born, all three doctors were fast asleep. This, however, was denied by Dr. Sims, who, in a letter which will be found in Playfair's 'Midwifery,' says: 'It has been said we had all gone to bed, but this is not a fact. Baillie retired about 11 and I lay down in my clothes at 12, but Croft never left her room.' A path is still shown at Claremont where Sir Richard Croft had walked up and down in agony not knowing what to do for the best, and Foot's statement that he went to bed is a libel. By command of the king a post-mortem examination was made by Sir Everard Home and Sir David Dundas, who reported to the king that there was no evidence of neglect, but that everything had been done which 'human science could devise or human skill effect.' The event so preyed upon the mind of Sir Richard Croft that three months later he shot himself."

INFANT MORTALITY IN CALCUTTA.*

"To read of an infant mortality approaching 500 per 1000 makes one pause and examine the figures to see if by any chance the printer has not left out the all important 'point'; yet 478 and 453 per 1000 are the correct figures for the Alipore and Jorabagan districts of Calcutta as given in Dr. H. M. Crake's annual report for 1915. In the former district there has been an exceptional rise, the usual rate being slightly over 300 per 1000; but in the latter the figure is not so surprising, for Dr. Crake describes it as an 'intensely congested quarter with great masses of buildings intersected by narrow gullies and its hundreds of tenement houses packed with humanity.' The suburban wards, though more open, contain 'thousands of poor families, wretchedly housed in damp, dirty huts, surrounded by grossly insanitary conditions,' all of which is 'obviously inimical to child life.' These external conditions are bad enough in themselves, but when combined with the foolish and pernicious practices followed by the women as a sort of religious ceremony, the appalling death rate is not without a sufficient explanation. The primary causes of so large a loss of infant life are not so far to seek. Poverty, dirt, insufficient food, confinement in foul dwellings, and the strain of frequent pregnancy and lactation inevitably produce puny, sickly babies, who survive only a few days. Next to congenital disability as an immediate cause of death, comes tetanus neonatorum—a wholly preventable disease, due entirely to dirty midwifery. The outstanding fact that not a single case of the disease has occurred among the babies brought into the world by the Corporation midwives is incontrovertible proof that these deaths are solely due to the filthy practices of the native midwife. After the first month there is a marked drop in the mortality and then, curiously enough in a sub-tropical climate, bronchitis and respiratory diseases come to occupy the chief place among the causes of death. Possibly some explanation of this phenomenon is to be found in the physiological fact that the young of all warm-blooded animals are particularly susceptible to changes of temperature, and among the poorer classes of natives, clothing for infants and children is considered superfluous, thus what vitality the infant may have is checked, and they are rendered more liable to be affected by the unsanitary surroundings. As part of the same problem 'diseases of child-bed' figure largely. In Calcutta they amount to about 1 in every 40 as compared with 1-2 per thousand in England. For similar reasons the incidence of tuberculosis among girls and young women is from three to six times as great as it is at the corresponding age periods among males.

"Such conditions cry aloud for a well-organized welfare scheme, which would do an immense amount of good if the mothers could be induced to take part: but Dr. Crake sees no immediate prospect of success for an institution of that kind in Calcutta. The health committee, however, have lately appointed a second health visitor and additional midwives, but there is as yet no satisfactory provision for looking after the infants during the first few critical weeks. As an experiment, a suggestion has been made to establish a small babies' clinic in connection with the Dufferin Hospital, to be conducted on lines similar to the welfare centers in this country. As an inducement for mothers to attend, a conveyance will be provided, and a small sum paid for each attendance by way of 'backsheesh.' Should this prove a success, a way will be opened through the barriers of ignorance, superstition and social custom, which now stand in the way of progress; and future years may see a development of the infant welfare movement such as is urgently needed in the city of Calcutta."

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* The Medical Officer, September 29, 1917.

WAR ACTIVITIES FOR ANTI-TUBERCULOSIS ASSOCIATIONS.

The National Association for the Study and Prevention of Tuberculosis offers the following suggestions for the consideration of state and local associations. They are formulated as the result of conferences with army officers, public health officials, and officers of the Young Men's Christian Association, Knights of Columbus and others engaged in war work. They have been found practicable in four cantonments, where the medical field secretary of the National Association has inaugurated these activities in coöperation with state anti-tuberculosis associations.

I. Procure a record of men rejected for service in the army because of tuberculosis or suspected tuberculosis.

1. Those rejected by local examining boards. There are 4557 of these local boards in the United States. While the "Regulations provide that the records of local exemption boards be made accessible to the public at such time as will not interfere with the work of these boards," as a matter of fact it has been exceedingly difficult to get the information desired by anti-tuberculosis associations. On September 29 the provost marshal, General Crowder, directed to The National Association for the Study and Prevention of Tuberculosis a communication establishing the authority of the governors of the several states to direct these boards to open their exemption records to representatives of the National Association or to representatives of the State Boards of Health. Copies of this letter from the War Department have been sent to all state boards of health and to state anti-tuberculosis agencies. It is suggested, therefore, that these names be secured and follow-up work be done as suggested below.

2. Rejected applicants for enlistment in the United States Marine Corps.

The commandant has directed all recruiting officers in the United States to report to the National Association the names and addresses of those applicants rejected because of tuberculosis or suspected tuberculosis since January 1, 1917. Not infrequently the applicant resides in a different state than the one in which he applied for admission to the Marine Corps. All these names are being reported to the proper state boards of health, and a copy of the report is being sent to the secretary of the state anti-tuberculosis association, or in case the man is from a large city, to the city anti-tuberculosis agency where he resides. Follow-up work as suggested below may be done for these men also.

3. Those rejected by regimental surgeons in the camps and cantonments.

In the hurry of the preliminary examinations for the draft, many tuberculous men were overlooked by the local examiners. In the examination at the camps by the regimental surgeons many of these overlooked cases are being found. Still other cases will be discovered by the special boards of expert examiners, which will later make surveys of the camps. The records of all cases rejected in camp are in the office of the division surgeon. In four camps the division surgeon has made available to the secretary of the state anti-tuberculosis association the names and addresses of those men rejected because of tuberculosis or suspected tuberculosis. We have found the military surgeons most courteous and ready to coöperate. We believe that such records in other camps and cantonments than those visited will be made accessible if the matter is fully explained.

If the secretary of any state association is unable to secure these names, it is probable that he can successfully point out to the division surgeon the desirability of reporting the names to the state boards of health of the states from which the men came. In those states in which there is no law requiring that tuberculosis be reported there may be some objection offered.

II. Follow-up work for all cases discovered.

This may be done by the distribution of educational literature. Pamphlet No. 106, "What You Should Know About Tuberculosis," issued by the National Association, is an excellent one, which is being distributed to Canadian soldiers. "Don't" cards have some value also. Health placards for street cars and public buildings should not be forgotten. They will be read by the man who has been discharged from the service on account of tuberculosis.

Visiting nurses should be asked to make a survey of the families of rejected conscripts, giving them verbal instructions, getting them to go to the family physician for physical examination, or to the dispensary.

Suitable cases should be induced to enter sanatoria.

III. Educational work for soldiers.

1. For the officers and privates of the line.

Most of this educational work can best be done in coöperation with the Young Men's Christian Association and the Knights of Columbus. These organizations have service buildings in which the men gather for entertainment and recreation. The Y. M. C. A. has several buildings in each cantonment, including an auditorium and an administration building. The general secretaries of these organizations should be consulted and arrangements made for the distribution of literature.

RESEARCH WORK AT THE FORSYTH INFIRMARY.

ONE of the most striking advances in the technic of dentistry is apparently foreshadowed by investigations and the development of methods at the Forsyth Dental Infirmary, whereby much of the labor and inconvenience of tooth excavation may be avoided, and a smooth, antiseptic base may be afforded for fillings, a base which may be applied almost with the facility of running water. The material is metallic silver, applied in the form of nitrate and precipitated by the action of formalin. The discovery comes in sequence in the work of a department of research which the infirmary has established.

The special matters in which the new process possesses advantages include chronic abscesses, in which a goodly number of cases, "the discards of a large clinic," have been treated at the Forsyth Infirmary. In troubles with the tip of the tooth it has proved efficacious.

This method of treatment is the outgrowth of a series of experiments conducted by Dr. Percy R. Howe, director of the laboratory, who presents a statement of his work in the *Dental Cosmos* for September. In a general way, the application of the new process may be described as sterilizing the whole of the decaying tooth pulp without removing any of it, and by a process extremely simple. The silver will be deposited on all exposed surfaces, forming a smooth, metallic covering. This may be the basis for usual filling processes. The extreme is, however, not recommended by Dr. Howe, but whenever the excavation is judged to be sufficient, the surfaces exposed may then be silver coated. This method of precipitating silver is much the same as that employed in the arts, in the making of mirrors for telescopes, etc.

Being in liquid form, the solutions penetrate throughout the putrescent pulp, into the neighboring parts of the tooth, where the advance rings of incipient decay have gone, and they follow cracks in the tooth material and canals. Wherever the formalin overtakes the nitrate, metallic silver is deposited, and here decay will be arrested, and this will occur everywhere that decay has started or where accidental or natural fissures exist. Repeated applications to an exposed surface will result in a very appreciable thickness of deposit, which may be burnished if wished and made to take on the luster of the metal.

RECENT DEATHS.

STEPHEN HULL SEARS, M.D., died at his home at Yarmouthport, November 25, 1917, of angina pectoris, aged 63. Dr. Sears had practised in Yarmouthport since 1900. He was a graduate of Bellevue Hospital Medical College, New York, in 1879.

DR. CHARLES H. S. DAVIS, of Meriden, Conn., died at the State Hospital, Middletown, Conn., on November 7. Dr. Davis was born in 1840. He was the author of books on medical and historical subjects. From 1873 to 1886 he was a representative in the State Legislature and was twice mayor of Meriden.

SOCIETY NOTICES.

BOSTON MEDICAL LIBRARY IN CONJUNCTION WITH THE SUFFOLK DISTRICT MEDICAL SOCIETY.—Medical Section meeting in John Ware Hall, Wednesday, Dec. 12, 1917, at 8.15 P.M.

The Treatment of Invalided Sick and Wounded
Major Edgar King, Medical Corps, U. S. Army.
Vocational Aspects of Reconstruction Work.
David L. Edsall, M.D.
Plans for Boston's Share in Surgical Reconstruction Work. Frederic J. Cotton, M.D.
Light refreshments after the meeting.

EDWIN A. LOCKE, M.D., *Chairman*,
GEORGE R. MINOT, M.D., *Secretary*.

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at the Robert Bent Brigham Hospital, Parker Hill, December 18, at 7 P.M.

Inspection of the hospital under the personal direction of Charles F. Painter, M.D.
Demonstrations in Therapeutics
F. H. McCrudden, M.D.
Medical Treatment of Chronic Arthritis
C. H. Lawrence, Jr., M.D.
Focal Infection in Chronic Arthritis.
L. M. Spear, M.D.

BRADFORD KENT, M.D., *Secretary*.

WORCESTER DISTRICT MEDICAL SOCIETY.—Next regular meeting, Wednesday, Dec. 12, 1917, at 4.15 P.M., G. A. R. Hall, 55 Pearl Street, Worcester.

Subject "Child Welfare."

This meeting is at the request of and in conjunction with the Worcester Committee on Child Welfare. The Speaker will be Dr. Fritz B. Talbot of Boston, whose subject is "Child Welfare Work in Massachusetts as a War Measure, with Special Reference to the Work of the State Committee on the Conservation of Child Life."

Any effort to offset the tremendous wastage of human life, now taking place and impending, challenges our active interest and support. Members are therefore requested to invite their friends, and the general public is hereby invited, to be present at this meeting and to participate in such patriotic effort as may result from it.

The War Committee desires to acknowledge the splendid way in which Worcester physicians have fulfilled our agreement with the Red Cross to furnish gratuitous medical service to needy families of soldiers. In order that this burden may be distributed as lightly as possible, it is desirable that every physician in this community notify the Committee of the number of calls he will make and the number of maternity cases he is willing to attend during 1918. Please telephone or write the secretary that he may systematize the distribution of future calls.

M. F. FALLON, *President*,
E. L. HUNT, *Secretary*.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY.—A meeting will be held on December 19, at 8 P.M., at the home of Dr. H. B. Jackson, 98 West Emerson Street, Melrose. The evening will be devoted to reports of cases

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Original Articles.

THE VALUE OF DIAGNOSIS IN BACK LESIONS.*

BY JAMES WARREN SEVER, M.D., BOSTON,

Junior Assistant Surgeon, Children's Hospital, Boston; Consulting Orthopedic Surgeon, Cambridge Hospital; Orthopedic Surgeon, Waltham Hospital.

THE title of my paper is a bit misleading, and should be read as the necessity of a correct diagnosis in back lesions. There is no question in anyone's mind as to the necessity or value of a diagnosis in any case, but it is essential that such a diagnosis be as correct as possible to enable not only the medical man to treat it properly, but also to furnish the Compensation Board and Insurance Company with correct information on which to base their findings.

For several years now it has been my good fortune to have seen many cases with stiff and painful backs for the Massachusetts Industrial Accident Board, as an impartial examiner. These have been sent to me for examination and diagnosis originally in the course of some dispute as regards the individual's disability, which of course involves his being entitled to compensation.

It has been a great surprise to me to find that a large number of these cases showed fractures of one or more vertebrae—so-called crush fractures—which had wholly escaped notice, and therefore treatment. Many of these individuals had gone for periods of time varying from several weeks to even a year, with no diagnosis and no treatment. It has seemed to me that to bring such a condition to your attention was well worth while, even if it does reflect somewhat on hospitals and the medical profession. First and last, it all comes down to an adequate checking up of the patient's complaint, by careful methods of examination, including the x-rays, as well as careful consideration of the history of the accident.

Practically all of these persistent back disabilities of the severer type are the result of falls, —from 10 to 60 feet,—and careful questioning will bring out certain mechanical features in regard to the position of the patient's body at the time of impact, which may go a long way towards making a correct diagnosis.

Simple back strains from lifting and bending are generally of short duration, and do not lead to dispute, for the periods of disability are short. This paper, then, will be largely a discussion of the question of diagnosis in cases of compression fracture of the spine, and therefore before going further, it will be necessary to go into detail somewhat as to what constitutes a compression fracture, its method of production, the nature of the accident, diagnosis, the subsequent course, and the question of long continued or permanent disability.

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* Read before the Fourth Annual Meeting of the International Association of Industrial Accident Boards and Commissions, Boston, Mass., August 22, 1917.

Definition of Compression Fracture.

A compression fracture of a vertebra is one where the body of the vertebra is crushed or flattened evenly, or more on one side than the other, and often more in the anterior portion than the posterior, depending on the direction of the application of the crushing force. As a rule, they are more compressed or crushed in their anterior portion than in the posterior.

Methods of Production.

Compression fractures of the vertebrae generally follow severe violence, applied through the long axis of the spine, or while the spine is forcibly flexed. Falls on the buttocks, shoulders or back, or landing on the feet from a height, combined with forcible flexion of the spine, are the most frequent causes.

Nature of Accident.

In an analysis of the cases which have been examined by me the following accidents caused compression fractures, either in one or more vertebrae in the same individual.

Table I.

1	Fell 23 ft. Landed on feet.	2nd and 3rd lumbar crushed	Kyphos
2	Caught under electric car, back forcibly flexed.	5th lumbar crushed	
3	Fell 50 ft. from a tree. Landed on back.	2nd lumbar crushed	Kyphos 1st to 3rd lumbar
4	Jumped from burning building.	Fracture 4th lumbar	
5	Thrown from motor. Landed on buttocks.	Fracture 4th and 5th lumbar	
6	Struck on back by planks falling off roof.	Fracture 1st and 2nd lumbar	Kyphos
7	Fell 12 ft. Landed on back.	Fracture 1st lumbar	
8	Fell 45 ft. on to a concrete floor.	Fracture 12th dorsal, 1st and 4th lumbar	
9	Walked out of 2nd-story window in sleep; fell 15 ft.	Fracture 12th dorsal, 1st and 2nd lumbar	Kyphos 12th dorsal to 1st lumbar
10	Fell 30 ft. Landed on buttocks.	Fracture 1st lumbar	
11	Run over by heavy truck.	Fracture transverse processes of 4th lumbar vertebra	
12	Fell 17 ft. Landed on back.	Fracture 1st lumbar	Kyphos 1st lumbar
13	Run into by second-hand Ford.	Fracture 4th lumbar	
14	Fell 14 ft. down elevator well. Landed on buttocks.	Fracture 2nd and 3d lumbar	Kyphos, slight
15	Fell with staging 50 ft.	Fracture 11th, 12th and 9th dorsal, and 1st lumbar	Kyphos, 9th and 10th dorsal
16	Fell with staging 40 ft.	Fracture 12th dorsal, 1st lumbar	
17	Fell 27 ft. Landed on back.	Fracture 1st lumbar	Kyphos, 1st lumbar.
18	Fell with staging 40 ft. Landed on feet.	Fracture 12 dorsal, 1st and 2nd lumbar	Kyphos, 12th dorsal
19	Fell 15 ft.	Fracture 1st and 2nd lumbar	
20	Doubled up under wagon.	Fracture 1st lumbar	Kyphos
21	Fell 12 ft.	Fracture 1st and 2nd lumbar	Kyphos, 12th dorsal
22	Fell 10 ft. through hole in stairway.	Fracture 1st lumbar	Kyphos
23	Bag of flour fell on back.	Fracture 1st lumbar	Kyphos

Here is concrete evidence that falls will and do cause fractures of the spine, without, in many cases, other symptoms than that of a lame and stiff back.

It will be noted that almost twice as many fractures took place at the level of the first lumbar vertebra than at any other location. This is probably due to the fact that the center of greatest mobility of the spine is at that point, and that also it is an area not very well guarded except by muscles, which do not offer the protection that is offered to the dorsal vertebrae by the ribs. (See Table II.)

Table II.

Location of Fracture	Individual Vertebrae Affected
9th dorsal	1
10th dorsal	2
11th dorsal	1
12th dorsal	6
1st lumbar	14
2nd lumbar	8
3rd lumbar	2
4th lumbar	4
5th lumbar	3
	41

That the fractures are not limited to one vertebra in any single case is evident by the fact that only eleven cases out of twenty-three showed that one vertebra alone was injured; seven showed that two vertebrae were fractured, three had three vertebrae fractured, and two had four vertebral bodies fractured.

Certain cases showed a deformity of the back as a result of the bony destruction known as a kyphos—a backward bowing at the point of fracture, due to a collapse of the vertebral body. This knuckle or kyphos is not a constant factor, but may result from the fracture of one or more bodies. It is a diagnostic point to bear in mind, and means, of course, only one thing, namely, destruction or distortion of the vertebral body. About 50% of the cases showed this deformity, coming apparently in those cases where the fracture was located near the dorso-lumbar junction. The kyphos may not make its appearance at once, following an injury, but may appear and increase somewhat during the convalescent period, when the individual is up and about, especially when without proper back support.

Symptoms.

The interesting thing about these cases, and probably the reason why so many of them are not diagnosed at first, is that they complain only of a stiff and painful back, with, generally, tenderness over the site of the fracture. Very few of the cases have any symptoms due to nerve pressure, and manifested as loss of sensation or paralysis of the legs, or incontinence of the bladder and rectum, which are always seen in cases of complete fracture of the back where the spinal cord is crushed. This lack of nerve involvement is probably due to the fact that the spinal cord ends at about the level of the first lumbar vertebra, the point of greatest frequency of fracture, and so escapes injury. Edema and hemorrhage about the cord may lead to temporary paralysis from pressure, but the symptoms from this condition usually clear up soon.

Practically all cases complain of a stiff, lame and painful back. They cannot bend freely and are more limited in side bending than in forward bending. Without treatment, that is, support to the spine, they go along complaining of the same conditions without relief until the fracture is discovered. Their disability at first is generally complete, but as time goes on they are able to be up and about, but not able to do heavy work.

TABLE III.

Date of Accident	Diagnosis Made by X-ray	Treatment before Diagnosis	Treatment after Diagnosis
July, 1910	5 months	None	
Oct. 7, 1914	6 months	Backbrace	Backbrace
June 24, 1914	1 year	Belt for last 4 months	Backbrace
Feb. 18, 1915	4 months	None	Jacket
Mar. 28, 1915	4 months	None	Backbrace
Apr. 2, 1915	6 months	None	Backbrace
Apr. 28, 1915	3 months	None	Brace
Sept. 27, 1915	At once	None	Bed
July 31, 1916	4 months	None	Jacket and Brace
Dec. 26, 1916	3 weeks	None	Corset
Feb. 14, 1914	1 month	None	Belt
Aug. 16, 1915	At once		Jacket
Dec. 27, 1915	2 months	Bed	Brace
Nov. 26, 1915	4 months	None	?
Apr. 30, 1916	3 months	None	Brace
Jly. 31, 1914	At once		Frame and Jacket
Oct. 31, 1912	2 months		Brace
Oct. 19, 1915	3 months		Jacket
Sept. 24, 1915	4 months		?
Nov. 6, 1916	3 months		?

Average: four months

It might be of interest to you to learn that an analysis of 17 of the cases showed that no diagnosis was made of the fracture at an average of four months from date of the accident. Several cases went five and six months, and one a year, before a diagnosis was made. This is not because the diagnosis is at all difficult to make, but simply because reasonable and due care is not used in the examination of the patient. It is certainly striking, and makes one think that the seeker after compensation is not always in the wrong, or that his symptoms are not always so subjective that they cannot be pinned down to some adequate anatomical defect. (See Table III.)

In regard to some of the graver symptoms accompanying these fractures, certain of the cases showed definite signs of injury to the spinal cord, manifested by loss of sensation in one or both legs, not complete, and more or less paralysis either early or late. Some of the cases which showed early loss of muscular power recovered it wholly, others have suffered permanent damage to the cord from pressure of the injured vertebrae, and will always have some paralysis of the legs.

Two of the worst cases, which showed paralysis from the first, are rather interesting. One was treated for pleurisy with effusion, or rather told that he had it, but was not treated, and no examination of his back was made, and the other was treated for hysteria in a hospital for seven weeks, meanwhile suffering from urinary retention and paralysis of both legs, and no examination was made of her back until the end of that time, when an x-ray was taken which, she was told, showed nothing.

The treatment, of course, in all these cases should be adequate fixation of the spine, in a plaster jacket at first, and later by means of a backbrace. The whole period of treatment will probably cover a period of several years. The question of an operation on the spine, designed to furnish support to the crushed vertebrae, has been considered and, I believe, has been done in some cases. The usual type of operation is that which uses a bone splint from the tibia inserted into the spinous processes. This procedure may shorten the period of convalescence somewhat, and may lead eventually to a somewhat stronger back in certain cases. Enough data have not been collected, however, to enable me to state definitely whether this operation should be used as a routine in all cases. As the callus forms about the fracture the spine loses its resilience and becomes stiff, especially to side bending, but the weakness and some soreness persist, especially after exertion such as walking, bending, or lifting. It is obvious that these individuals are totally disabled from further heavy work. There may be exceptions to this statement, but it is a good rule to go by, that once a laborer has had a compression fracture of the spine, he had better begin to look for some other kind of a job. The sooner he gets light work the better it is for him and for the insurance company; and here I might add that the sooner the insurance company takes an intelligent interest in the after-treatment of these industrial accidents, the better it will be for them and for the injured parties; for these reasons, *i.e.*, by seeing that, first of all, a diagnosis is made and then proper and competent after-treatment is carried out, with as frequent medical attention as is necessary. This may seem to be an addition to the already heavy medical expense they all claim they are under, but such a course would soon pay for itself and become a profit, if put in the proper hands, and would eventually show a marked reduction in compensation allowances. Men would get back to work much sooner and would not drift about, as many do now, with little or no treatment, and continued inability to work, because of their lack of treatment.

CASE HISTORIES.

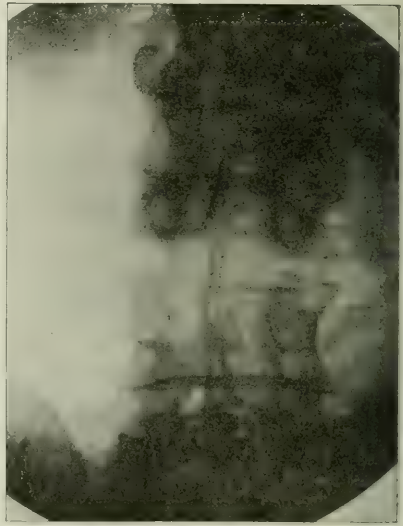
The first 11 cases in this series have been reported in detail in two previous publications by the author[1] and may be consulted there. The rest of the cases will be reported in detail here in order as shown in Table I.

Case 12. Seen Nov. 17, 1916. J. S., male. Fell 17 feet when a ladder broke, July 31, 1916. No leg paralysis; bladder and rectum not involved. For first 2 weeks after injury was treated by having back strapped. Then had high frequency applied for "neuritis" for several weeks without benefit. No further treatment until November, 1916, when back was x-rayed and a plaster jacket applied, which was worn 3 weeks. He complains of pain in the back, especially on stooping, and is unable to lift anything. Was in bed at first for 3 weeks. Following removal of jacket, wore a narrow canvas belt around hips. Examination of back, made June 2, 1917, shows that he had a small kyphos in the region of the 12th dorsal and 1st lumbar vertebrae. He bends forward pretty well, but his back is stiff in bending in other directions. His nervous reflexes are normal, and he has no loss of sensation over any skin areas. The x-ray shows a compression fracture of the body of the 1st lumbar vertebra. This man was later fitted with a proper spring backbrace and was seen again in August, 1917, when he had improved sufficiently to do light work. His back still got tired and the kyphos still existed. His disability, of course, is permanent.

Case 13. H. H., male, 47. Struck in back by the mud-guard of a motor car and thrown across a garage. He was able to go home, and later had his back strapped, which gave him some relief. Has pain in the back all the time, low down, but does not go into legs. Never had any paralysis or loss of sensation. The pain does not keep him awake, and he can lie on his back better than he can on his side. Comfortable when sitting down, but goes up and down stairs only with difficulty. Been unable to work since accident three weeks ago.

Examination shows that his back is tender and sensitive in the middle line low down. He is stiff in bending in any direction. The sensation is normal, except that there is some hyperesthesia over the buttocks and upper sacral region. The knee jerks are normal. An x-ray showed that there had been a fracture of the left-hand upper corner of the 5th lumbar vertebra, and a partial crush of the right side of the body of the 4th lumbar. There was also a slight lateral displacement of the whole spine above the 5th lumbar.

This injury was the result of a direct violence, and was completely disabling as far as his ability to work went. A heavy canvas corset was made for him, which he has been wearing now for about 7 months with great relief. He is able to do most of his usual work except heavy lifting. He has to wear the corset night and day, and still has a stiff, and occasionally painful back.



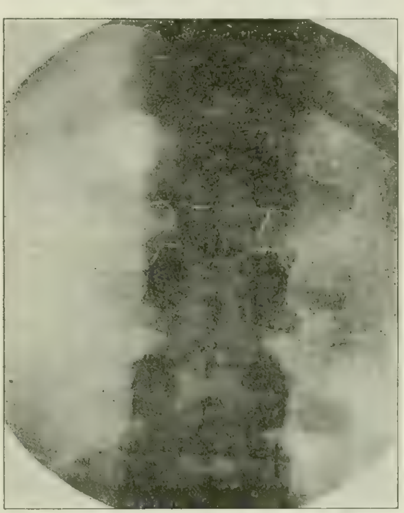
CASE 14, X-RAY NO. 1. Shows a crush fracture of a 2d and 3d lumbar vertebra, the 2d lumbar being crushed more on the left side than on the right. There is obliteration of the intervertebral space between the 2d and 3d, and there is also callus formation, particularly on the right, between the bodies of the 2d and 3d.

Case 14. H. M., male, 44. Accident Feb. 14, 1914. Examined May 5, 1917. Fell down an elevator well, a distance of about 15 feet, and landed sitting down. He was taken to a hospital, where he stayed a few hours and had no treatment, going home later on the electric cars. He was in bed for 5 weeks, during which period his back was strapped. He never has had any paralysis or loss of sensation. For the last year or so he has worn a canvas belt, which makes him more comfortable. He complains of pain and weakness in the back, and thinks that the condition is not better than after the accident. There are some days when he is free from pain, but when he has it, it is localized in the small of the back. He is able to do light farm work, but cannot lift, or saw wood, and has been unable to go back to his previous occupation as a meat cutter. Examination shows that he is a well developed and nourished man, who walks normally, and has a rather short, broad back. There is a small kyphos in the lumbar region about the level of the 2d lumbar vertebra. His back is not stiff, and he can bend fairly well in all directions. An x-ray shows that he has had a crush fracture of the 2d and 3d lumbar vertebral bodies, the second being crushed more than the third.

Here is an individual who has gone about for three and a half years with no more support than a light canvas belt, to partly hold a fracture of two vertebral bodies. He has done pretty well in spite of this, but should have had a jacket or back-brace. With better support he would even now be able to do more work. He is, of course, permanently disabled. (See X-ray No. 1.)

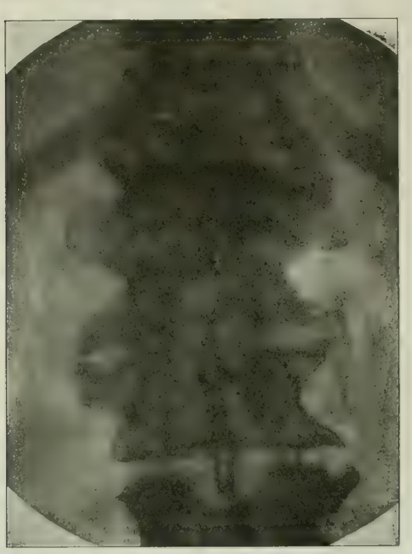
CASE 15. J. B. W., male, 44. Accident Aug. 16, 1915. Examination March 14, 1916. This man fell with a staging a distance of about 50 feet. He was made unconscious and does not know how he struck. He was in a hospital for over 3 weeks, where he had a plaster jacket applied, which he wore only a week. Since then he has worn nothing to support his back except a narrow canvas belt. He was in another hospital, a large metropolitan one, for 2 weeks, some time later, where he had no treatment, but had a number of x-rays taken for purposes of diagnosis. The first week following the accident, he had to be catheterized, but since then has had good control over bladder. He complains of weakness in both legs, and both legs feel as if they were asleep. He cannot stand well without support, and has a double toe drop. Examination shows that he walks with rather an ataxic gait. Both feet show no muscle power except very slight in toe flexors and moderate in gastrocnemius. The other leg muscles are of good strength. Double ankle clonus and knee jerks much exaggerated. No Babinski. Sensation to pin prick somewhat diminished over lower third of both legs. The back shows a kyphos in the region of the 9th and 10th dorsal vertebrae, not tender. The back is stiff and he cannot bend easily on account of loss of control of the legs. An x-ray shows that the 9th dorsal vertebra is crushed rather evenly and symmetrically. The 10th dorsal is apparently uninjured; the 11th, 12th dorsal and 1st lumbar vertebrae are crushed, especially the 12th dorsal, which is markedly flattened and displaced laterally. In the low lumbar region the intervertebral space between the 4th lumbar and 5th lumbar is partly obliterated, but no fracture can be made out. This man obviously has a permanent disability. The cord injury is slight, considering the number of vertebrae injured. The lack of treatment is not unusual, and he would be better with proper support. He will never be able to do much of anything in the way of work, except what can be done sitting down.

CASE 16. C. B., male, age 38. Accident Dec. 27. 1915. Examined March 1, 1916. This man fell about forty feet when a staging he was on collapsed. He was made unconscious and was taken to a nearby hospital. He had no trouble with his bladder or rectum, and could move his legs from the first, but stated that it hurt him to do so. He stated that he landed on his feet when he fell and became unconscious. In the hospital he had some x-rays taken of his back, which, he was told, was uninjured and that the x-rays showed nothing abnormal. He stayed in bed in the hospital for about 30 days and then went home. He had no treatment for his back. Since going home he has been up and about, although he has had to use a cane, on account of pain and swelling in his legs. He has not been able to go back to his work as a plasterer. Examination showed that his back was very stiff and tender. There was a slight kyphos in the dorso-lumbar region. The knee jerks were increased and he had a slight ankle clonus on the right and one more marked on the left. The sensation was normal. An x-ray of the spine showed a crush fracture of the 12th dorsal and 1st lumbar vertebrae, with a question of injury to the 2d lumbar. At this time he was wearing no support for the back and had never had any. This man was seen again a year later. He was still unable to work, on account of pain in the back. His legs are not strong and he has to walk with a cane, but can get about better than he could a year ago. He is now wearing a corset which he got through some magazine advertisement, in spite of the fact that he is also receiving back exercises at a large orthopedic clinic. His knee jerks are now normal and the ankle clonus has disappeared. (See X-ray No. 2.)



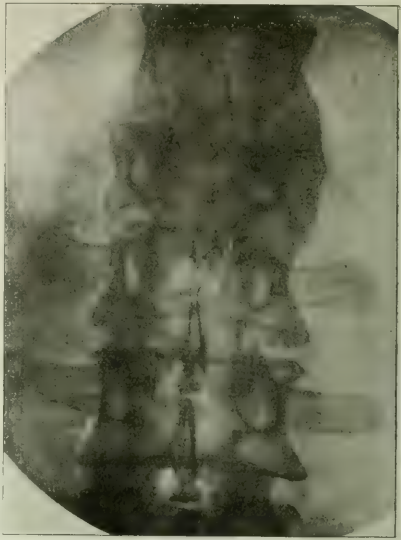
CASE 16, X RAY NO. 2. Shows a crush fracture of the 12th dorsal and the first lumbar vertebra, the bodies being jammed directly into each other. The 2d lumbar is asymmetrical and has probably also been crushed slightly. There is considerable new bone formation about the sides of the 12th dorsal and first lumbar.

CASE 17. J. P., male, age 28. Accident Nov. 26, 1915. Examination, March 29, 1916. This man was working on a pile driver, when he fell 27 feet and injured his back, and, also, at the time of the accident his fall was broken somewhat by a cross-bar, which struck him across the back. He also broke his left leg at the ankle. He was taken to a hospital and a cast was put on the leg, but he had no examination or treatment for his back. Since leaving the hospital he has been at home, unable to work on account of pain in the back and disability in the ankle. Examination of the back shows that it is very flexible. There is a small kyphos on standing at about the 11th dorsal vertebra. His nervous reflexes are normal. An x-ray showed a fracture of lamina of the 1st lumbar vertebra with displacement downward of the distal ends of the lamina and its attached spinous process. This man's back was not his principal difficulty, but it is interesting that he never has had any treatment for it and has been able to get about without much discomfort.



Case 18, X-ray No. 3. Shows a fracture of the 12th dorsal, 1st and 2d lumbar. Note the squashing of the first lumbar with the new bone formation around its sides. There is also considerable spur formation or lipping on the edges of the other lumbar vertebrae.

Case 18. F. G., male, 45. Accident April 30, 1916. Examination Feb. 10, 1917. This man fell about 40 feet when a scaffolding gave way. He landed on his feet, and was then bent forward violently, his knees coming in forcible contact with his ribs. He was laid up in bed at home for 6 weeks, not able to get up because of pain in the back. He has never had any trouble with his bowels or difficulty in passing his water. Has never had any loss of power in his legs or loss of sensation. Sometime in July, 1916, he went to the Massachusetts General Hospital, where he was fitted with a backbrace, which he has worn more or less ever since. This has given him some comfort and relief from pain. For the last 4 months he has been having massage and manipulation for his back by his own physician. He stated that he was getting better slowly, and was able to do chores around the house, but was not able to go back to his usual work as a laborer, on account of the persistent pain and weakness in the back. Examination showed that his back was flexible to forward bending without pain, but that side-bending was stiff and much restricted and caused pain. There was a small kyphos in the region of the 2d lumbar vertebra. The legs and nervous reflexes were normal. The x-rays showed a severe compression fracture of the 1st lumbar vertebra, possibly involving also the last dorsal and the 2d lumbar. There was considerable callus formation about the site of the fracture, which is not unusual and has been noted in some of the cases previously reported. This man was getting fixation by means of a brace, which was what he needed, part of the time, and then he was getting forcible manipulation every day, which was what he did not need. Rest and fixation do more good than active treatment and are a sure way to relieve pain. (See x-ray No. 3.)



Case 19, X-ray No. 4. Shows a crush fracture of the 1st and 2d lumbar, with marked callus formation and obliteration of the intervertebral space, the callus being more marked on the right side.

Case 19. T. F., 40, longshoreman. Accident July 31, 1914. Examination Jan. 28, 1916. This man fell 15 feet and landed on his left hand and hip. He sustained a fractured wrist and injured his back. He was taken to a hospital, where he was kept on a Bradford frame for about 5 weeks and then wore a plaster cast for 6 weeks, since when he has worn a corset. At first, following the accident he stated that he could not move his legs, and this condition continued for about 4 weeks. Whether this was due to actual paralysis or not, I do not know. As he had no loss of sensation and no loss of control of the bladder or rectum, I question the existence of actual nerve injury. He has been able to do no work since the accident, and felt that he was not getting any better, or his back any stronger. He stated that the back gets lame and stiff, and that he always gets a backache while sitting down. He is more comfortable lying down flat on his back.

Examination shows that he has a fairly flexible back. The movements were rather guarded. There was no kyphos. His reflexes were normal. An x-ray showed that he had sustained a crush fracture of the 1st and 2d lumbar vertebrae. The right side of the 1st lumbar was broken, and the 2d lumbar was crushed down on itself evenly. There was considerable new bone deposited about the two vertebral bodies, especially on the right side. This man has, of course, a permanent disability.

which will prevent him from ever doing his usual work as a longshoreman. An interesting thing about the case, from the point of view of diagnosis, was that previous x-rays, taken since he left the hospital, were interpreted as showing no bone injury. (See X-ray No. 4.)

Case 20. D. McC., 51, teamster. Accident, Oct. 31, 1912. Examination May, 1916. This man had the true mechanical factors in his accident to produce the typical flexion fracture. He was caught under the front of an empty team, and in attempting to stop it, put his feet against the front axle and pushed. The team was heavy and doubled him up, as he lay on the ground on his back. He was taken to a hospital and kept on a Bradford frame for 3 weeks. X-rays taken at that time, he stated, showed no abnormality. He was discharged from the hospital at his own request Nov. 29, 1912. He was then treated by his own physician, by sticking plaster strapping. Later, early in 1913, he had a backbrace applied, which he has worn since and which he stated he could not do without. He has never had any signs or symptoms of cord pressure. He complained of pain and soreness in the back, and consequent inability to work.

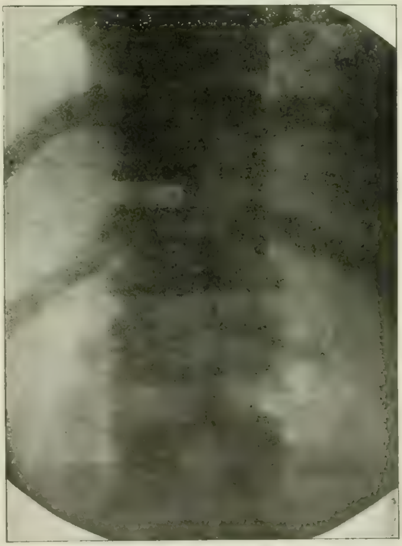
Examination showed that while standing he was somewhat tender in the dorso-lumbar region, and that there was a slight kyphos which could be felt at the dorso-lumbar junction. He could bend forward freely, but could not bend very well to the side. An x-ray examination showed a fracture of the 1st lumbar vertebra, with an obliteration of the space between the 1st lumbar and 12th dorsal, with some callus formation. This man will be unable to do his usual work as a teamster, and should get some sort of light work to do instead of drifting about, doing nothing, which is demoralizing physically and morally.

Case 21. D. C., male, 39, plasterer. Accident Oct. 15, 1913. Examination, Oct. 30, 1916. This man fell a distance of 12 feet on to some stones. He does not know how he landed. He was taken to a hospital, where he stayed 9 days, but had no treatment. He was told an x-ray of his back taken there showed nothing abnormal. After leaving the first hospital he went to another, where another x-ray was taken and a plaster cast applied to his back. This he wore about 10 months. This was followed by a backbrace which he is still wearing. He has been unable to do any work since the accident on account of pain in the back and some weakness. He is unable to get about without some sort of back support, such as the backbrace given him.

Examination shows that the back is rather stiff in bending. There is a moderate kyphos in the region of the dorso-lumbar junction, involving apparently one or two vertebrae. He stands with rather a rounded back, protuberant abdomen and flat chest. His sensation and reflexes are normal and apparently always have been: another case with total disability for heavy work. An x-ray showed that he had sustained a compression fracture of the 1st and 2d lumbar vertebrae. The 2 bodies are jammed together with a consequent obliteration of the intervertebral space.

Case 22. Wm. C., male, 42. Accident Sept. 24, 1915. Examination Feb. 26, 1916. This man stepped through an incompleted stairway in the dark and fell about 10 feet. He landed on his back. He was taken to a large hospital where he stayed 4 hours. While there his back was x-rayed and he was told that there was nothing the matter. His back was strapped and he went home. He was laid up at home, but not in bed, for 7 weeks, and did not go back to work for two reasons: (1) that his back hurt him, and (2) that he could not get anything to do. He complains of pain in the back now, localized low down in the region of the sacrum. This pain is better some days than on others. He has some pain and discomfort when getting in and out of a chair.

Examination showed that he could bend his back well forwards and sideways. There was a small projection backward of the spine in the region of the dorso-lumbar junction, which was tender. X-rays of the spine showed that there was a flattening and crushing of the body of the 1st lumbar vertebra, with some callus laid down between it and the 12th dorsal vertebra above, and the 2d lumbar below. There was an obliteration of the intervertebral space between the 1st and 2d lumbar vertebrae. This man had a not very severe fall,—few symptoms following, except backache,—and expresses a willingness to go to work, yet he has had a fracture of one of his vertebral bodies. He has also been without any real treatment since the accident. I believe that many of the unexplained backaches following falls and injuries of various sorts, which heretofore have been called "railway spines," "neurasthenic spines," and "traumatic spines," may have well been fractures of the vertebral bodies of this type.

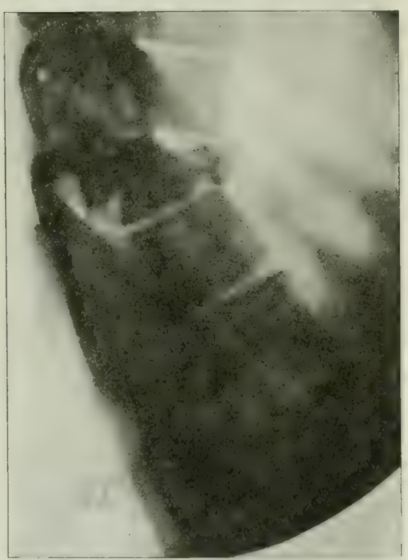


Case [illegible]. X-ray No. [illegible]. Shows [illegible] fracture of the 1st lumbar vertebra. Note the [illegible] that the [illegible] of the body.

Case 23. S. A., male, 29. Accident Nov. 6, 1916. Examination July 30, 1917. This man stated that a bag of flour fell from a height on to his back, as he was stooping over. After the accident he was taken to a hospital, where his back was strapped, and he was kept in bed for 17 days, at the end of which time a plaster jacket was applied. This he wore for 32 days. No x-rays were taken there, but he had some taken in Boston February, 1917, which were reported as negative. He has been without support to his back since the plaster cast was removed. He complains of considerable pain and weakness in the back, more marked when walking around and when trying to lift anything than when sitting or lying down.

Examination shows that his back is flexible to all motions, but that he complained of pain in side bending. There was a small kyphos at the 1st lumbar vertebra. There was no evidence of any nerve involvement. An x-ray showed that he had sustained a crush fracture of the 1st lumbar vertebra. (See X-ray No. 5.)

This man has a permanent disability which will prevent him from doing any heavy work in the future. He needs a support of some kind for his back, which will give him more comfort than he now enjoys.



X-ray No. 6. Shows a lateral view of a compression fracture of the 9th dorsal vertebra, the result of an automobile accident. There were no symptoms of nerve pressure in this case; there was a small kyphos in a girl of about twenty. Used by permission of Dr. R. W. Lovett.

Now what conclusions does a study of a group of cases like these lead one to arrive at? In my own mind, they are as follows,—namely, that, first of all, the necessity and value of a diagnosis is demonstrated; and, second, that few cases get a careful and adequate examination.

1. Compression fracture of one or more vertebral bodies is not uncommon, following falls on the feet or back, or following the dropping of weight directly onto the flexed spine.

2. The fracture is generally the result of forcible flexion of the spine.

3. There usually is no nerve involvement or cord pressure.

4. The injury results in a weak, stiff and painful back.

5. The examination of any back case, especially following an injury, is always incomplete without a good x-ray.

6. There is usually a kyphos present, not always appearing at once.

7. The disability for heavy work is usually permanent.

8. That in so far as the majority of cases is concerned, they go unrecognized as fractures of the vertebral bodies, because of inadequate examination, and consequently continue to suffer pain and disability, which is real and not feigned.

9. No individual who complains of pain, soreness or stiffness in the back, following an injury or fall, should go without careful examination of the back.

To quote from one of my previous papers in regard to the prognosis:[2]

"The bony repair is generally good in these lumbar cases, and although there may be a persistent stiffness, the supporting function of the spine is generally good, even in spite of a kyphos, which may tend to increase somewhat. Permanent disability, so far as doing heavy laborious work goes, generally follows such an injury, and as a rule a light backbrace is needed for some time, or always, to give comfort and stability. The prognosis, as far as life is concerned, is generally excellent, provided no cord injury has occurred."

REFERENCES.

[1] Surgery, Gynecology and Obstetrics, March, 1916.
[2] Boston Medical and Surgical Journal, Vol. clxxiv, No. 17, April 27, 1916.

STUDIES OF INFANT FEEDING.

IX.

The Availability of Dicalcium Phosphate When Present as a Constituent of Infants' Food.

By H. I. Bowditch, M.D., Boston, and A. W. Bosworth, Boston.

[From the Boston Floating Hospital Laboratories.]

INTRODUCTION.

One of the striking differences brought out by the comparison of the analyses of the feces of breast and bottle-fed babies is in the amounts of insoluble inorganic phosphorus found,—feces from breast-fed babies having from 0 to 0.06 grams of P_2O_5 per twenty-four hours, while the feces from bottle-fed babies will show amounts depending upon the quantity of cow's milk fed: sometimes being as high as 1.0

gram P_2O_5 per twenty-four hours. We have determined that this insoluble inorganic phosphorus is present in the form of calcium phosphate. Now, as it has been shown that insoluble dicalcium phosphate is present in suspension as a normal constituent of cow's milk,[1] and is not a constituent of breast milk,[2] the question arose as to whether the large amounts of phosphates present in the feces of bottle-fed babies are due directly to the insoluble phosphates present in the cow's milk used, or to other causes. The investigation reported here was undertaken in order to ascertain if dicalcium phosphate is available as a food when present as a constituent of infant's food.

Our results seem to indicate that children over four months old can use a small part of the dicalcium phosphate, while younger infants cannot utilize any of it. This finding would seem to have special significance in connection with the use of limewater in infant feeding, as we have shown[3] that the addition of limewater to milk results in a precipitation of insoluble calcium phosphate, brought about by a chemical reaction which may be expressed as follows:

$$CaCl_2 + 2\ NaH_2PO_4 + Ca(OH)_2 = 2\ NaCl + 2\ CaHPO_4 + 2\ H_2O.$$

It is possible, by the addition of limewater in quantities no larger than are commonly employed in infant feeding, to reduce the soluble calcium and phosphorus in modified mixtures of cow's milk to amounts less than those found in breast milk. We believe this fact may have a direct bearing upon certain abnormalities found in connection with infant feeding.

EXPERIMENTAL.

I.

Metabolism studies with synthetic milk containing no inorganic salts.

In order to control all factors entering into the composition of our food, it has been necessary for us to use a synthetic milk. This milk is made from pure butter fat, lactose, sodium caseinate and distilled water, according to the method already published by us.[4] In order to show that such a milk, which contains only the organic constituents named, none of the salts ordinarily found in milk being present, is readily digested and absorbed, and also to show the amounts of calcium and phosphorus eliminated in the feces when such a milk is fed to infants, we give figures from two metabolism periods with such a food. For comparison, we also give data obtained while these children were also receiving modified cow's milk.

The figures in Table I bring out several interesting and important points, among which may be mentioned the small amounts of dry feces, fat, phosphoric acid and calcium eliminated while the synthetic milk was being fed. The decrease in the fat elimination we shall consider in another paper. The small amounts of phosphoric acid and calcium eliminated when the synthetic food was fed are of importance in connection with the subject of this paper, in that, with this knowledge at hand, we are enabled to make quantitative measurements of the amounts of calcium phosphate eliminated in the feces when this salt is added to synthetic milk similar to that used in obtaining the above data.

II.

Metabolism studies with synthetic milk containing sodium caseinate and no inorganic salts other than dicalcium phosphate, $CaHPO_4$.

As it was quite possible that the presence of fat might have some bearing on the question involved, we have fed dicalcium phosphate ($CaHPO_4$) in synthetic milk, both with and without fat. The data obtained would indicate that the presence or absence of fat in the food is not a factor in the problem under consideration.

TABLE I.—ELIMINATION OF CALCIUM, PHOSPHORIC ACID AND FAT WHEN INFANTS RECEIVE SYNTHETIC MILK CONTAINING NO INORGANIC SALTS.

	Food					Urine			Feces				
Kind	Amt. Ingested	Fat	Sugar	Protein	P_2O_5 in Casein	Volume	P_2O_5	CaO	Dry Weight	Fat	Nitrogen	P_2O_5	CaO
		Grams	Grams	Grams			Grams	Grams					
No. 70. 5 Weeks													
Modified cow's milk 2-6-1-6*	795	15.9	47.7	12.72	—	570	.342	.025	10.80	5.53	.42	.586	1.672
Synthetic milk 2-6-1.6.....	795	15.9	47.7	12.72	.204	550	.264	.000	1.51	.40	.10	.047	.013
	795	15.9	47.7	12.72	.204	440	.229	.000	1.58	.39	.10	.032	.013
	795	15.9	47.7	12.72	.204	470	.235	.000	3.68	.73	.28	.039	.029
	795	15.9	47.7	12.72	.204	490	.200	.000	3.76	.74	.27	.043	.018
Daily Average............									2.63	.56	.19	.040	.018
No. 101. 6 Months													
Modified cow's milk 3-6-1.5	1200	36.0	72.0	18.00	—	560	.414	.032	6.94	4.34	—	.121	.934
Synthetic milk 3-6-1.5.....	1200	36.0	72.0	18.00	.288	550	.313	.013	3.09	.66	.22	.007	.012
	1200	36.0	72.0	18.00	.288	500	.270	.013	2.47	.48	.18	.017	.010
	1043	31.3	62.6	15.70	.251	540	.231	.013	2.65	.53	.16	.035	.010
Daily average............									2.74	.42	.19	.020	.011

* Fat 2%, sugar 6%, protein 1.6%.

Age seems to be a factor, however, for it will be noticed that the older children have apparently utilized considerable of the phosphate.

During these investigations, the amounts of food ingested were recorded and the urine and feces were collected in twenty-four hour amounts. The feces at the beginning and end of the periods were marked off with carmine red. Powdered agar was added in some cases to increase the bulk of the feces and help to overcome constipation, which frequently results when a salt-free milk is fed to infants for more than one or two days. This agar contained 1.1% of CaO, and explains the excess of calcium in the feces above that required to give the theoretical amount to combine with the P_2O_5 to give dicalcium phosphate.

The data obtained from the analyses of the urine are similar in all respects to those given in Table I, and for this reason will not be given here.

The fat elimination in all cases showed the same decided drop from several grams per day on modified cow's milk to a gram or less when on synthetic milk.

Table II gives the amounts of calcium oxide and phosphoric acid, P_2O_5 fed as $CaHPO_4$, and the amounts recovered in the feces.

TABLE II.—CALCIUM AND PHOSPHORUS METABOLISM WHEN INFANTS RECEIVE SYNTHETIC MILK CONTAINING DICALCIUM PHOSPHATE.

	115	119	117	120	122	118	121
AGE	8.5 Mos.	8 Mos.	4 Mos.	4 Mos.	4 Mos.	3.5 Mos.	3 Mos.
In Food							
Fat	0	3%	0	3%	3%	0	3%
Grams CaO in $CaHPO_4$	1.044	1.332	0.999	1.430	1.432	0.748	1.684
Grams P_2O_5 in $CaHPO_4$	1.323	1.688	1.267	1.798	1.820	0.948	2.136
In Feces							
Grams Fat	0.860	3.220	3.140	4.960		1.660	
Grams CaO	0.642	1.546	1.059	1.374	1.469	0.852	1.679
Grams P_2O_5	0.840	1.309	1.163	1.678	1.855	1.090	2.067
Per cent. $CaHPO_4$ assimilated	36.5	22.8	16.4	6.7	0.0	0.0	3.2
Length of Period	4 d.	4 d.	5 d.	4 d.	4 d.	4 d.	4 d.

III.

Metabolism studies with synthetic milk containing calcium caseinate and all the inorganic salts of cow's milk except the soluble calcium and phosphorus, together with some insoluble dicalcium phosphate.

While the experiments reported above show that, under the condition there given, the dicalcium phosphate is more available to infants six to eight months old than it is to younger infants, it does not tell us how available this same salt is when fed as a normal constituent of cow's milk; and in order to throw some light on this phase of the question, we have fed a synthetic milk made from butter fat, lactose, calcium caseinate, sodium caseinate, and a special protein free milk powder from which all the calcium has been removed.* The milk, as made from these materials, resembles modified cow's milk in all respects, except that, in place of the albumin of the cow's milk, we have used sodium caseinate. The object of this investigation was to determine what influence the calcium of the calcium caseinate will have on the assimilation of dicalcium phosphate. We give below the data in detail from one child eight months old.

The food fed during this investigation contained 3% fat, 6% lactose, 2.4% protein (1% sodium caseinate and 1.4% calcium caseinate), and 0.3% soluble salts of milk.

The period during which the $CaHPO_4$ was added to the synthetic milk was preceded by two days during which the child received no $CaHPO_4$ in the synthetic milk. This preliminary period was introduced in order to sweep out from the intestines any insoluble calcium phosphate derived from the modified cow's milk which the child had been receiving.

The $CaHPO_4$ was fed by placing 0.5 gram of this salt into each bottle of food fed to the child. All bottles containing any unconsumed food were saved, and the amounts of $CaHPO_4$, calcium as caseinate and P_2O_5 in casein remaining were determined. The $CaHPO_4$ was fed for four days, the urine and feces being carefully collected during this time.

TABLE III.—AMOUNT OF CaO AND P_2O_5 INGESTED AND EXCRETED WHEN SYNTHETIC MILK CONTAINING $CaHPO_4$ AND CALCIUM CASEINATE IS FED

	P_2O_5 GRAMS	CaO GRAMS
Ingested in four days		
In casein	1.722	1.582
In $CaHPO_4$	5.402	4.323
Total	7.124	5.905
Excreted in four days		
In urine	2.251	0.179
In feces	5.578	5.975
Total	7.832	6.154
Balance for four days	−0.708	−0.249
Average daily balance	−0.177	0.062
Per cent. $CaHPO_4$ assimilated	0	0

The amounts of calcium oxide and phosphoric acid recovered are given in Table III. An examination of these figures will show that none of the calcium phosphate was utilized by the child, and that more calcium and phosphorus were recovered in the feces than was fed as $CaHPO_4$, indicating that the calcium caseinate upon hydrolysis in the intestines had yielded calcium and phosphoric acid which had united to form insoluble calcium phosphate, the child thus eliminating more calcium phosphate than he received.

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* Our method for the preparation of this protein free and decalcified milk powder will be published later.

The excess of calcium in the feces over that required to form $CaHPO_4$ is present as calcium soaps,—a subject which will receive more detailed consideration from us in another paper.

IV.

The effect of feeding an excess of soluble calcium on the phosphorus metabolism.

We have shown in the preceding table that the calcium of the calcium caseinate may unite with the phosphoric acid formed by the hydrolysis of the casein molecule, the insoluble calcium phosphate thus formed being excreted in the feces. As a matter of interest in connection with another phase of calcium metabolism, we wished to know what influence an excess of calcium would have on the assimilation of the phosphorus of the casein molecule. For this investigation, a food was made which contained 2% fat, 6% sugar, and 2% calcium caseinate. The calcium caseinate was made by dissolving pure casein in limewater in the proportion of one grain of casein to ten cc. limewater. After the synthetic milk had been homogenized, some of a 10% solution of calcium acetate ($[CH_3COO]_2Ca.H_2O$) was added to it at the rate of 0.75 cc. per ounce of food.

The data obtained show that it is possible, by excessive calcium feeding, to precipitate all the phosphorus of the food in the intestines as insoluble calcium phosphate, thus reducing the phosphorus metabolism to such a low level that the urine becomes phosphorus-free and contains a large amount of carbon dioxide.

Table IV.—Phosphorus Metabolism with a Synthetic Milk Containing a Large Amount of Soluble Calcium.

Food	24 Hours
24-hour amount	1200.0000
CaO in caseinate	.6048
CaO in acetate	.9540
Total CaO	1.5588
P_2O_5 in casein	.3840

	Urine			Feces	
Day	CaO	Cl	P_2O_5	CaO*	P_2O_5
1st	.0413	.228	.328	1.265	.275
2nd	.0842	.290	.094	1.210	.224
3rd	.0811	.049	.013	1.824	.340
4th	.0780	.000	.009	.705	.136
5th	.0722	.060	.017	.852	.198
6th	.1949	.298	.000	1.787	.410
7th	.1958	.112	.000	1.729	.393
8th	.2144	.068	.000	1.685	.459

* The excess of CaO is present as Ca soaps of fatty acids and as calcium carbonate.

CONCLUSIONS.

It has been previously shown by Van Slyke and Bosworth that cow's milk contains 0.175% of dicalcium phosphate ($CaHPO_4$), and in this paper it has been shown that this phosphate was not available as a food to children under four months of age, and only partly available to older children. This utilization of calcium phosphate by the older children is probably dependent upon the more abundant secretion of hydrochloric acid.

In connection with the results reported here, it is of interest to consider the fact shown by Bosworth[2]—that human milk, unlike cow's milk, contains no dicalcium phosphate, the mineral elements in human milk therefore being completely available as food for infants.

In calculating the amount of mineral elements present in modified cow's milk for use in infant feeding, the dicalcium phosphate should be considered as unavailable, and a corresponding deduction made from the total mineral elements in milk.

We have shown that during the process of digestion of calcium caseinate the calcium and phosphorus contained within the calcium caseinate may unite to form insoluble calcium phosphate and appear in the feces as such, the calcium and phosphorus balances under these conditions becoming negative.

We have also shown that by feeding a large amount of soluble calcium it is possible to precipitate practically all the phosphorus in the food as insoluble calcium phosphate, this substance being eliminated in the feces, and as a result of this the metabolism of phosphorus is reduced to such a low level that the urine becomes phosphorus-free.

REFERENCES.

[1] Van Slyke, L. L., and Bosworth, A. W.: Jour. Biol. Chem., 20, 135, 1915.
[2] Bosworth, A. W.: Jour. Biol Chem., 20, 707, 1915
[3] Bosworth, A. W., and Bowditch, H. I.: Jour. Biol. Chem., 28, 431, 1917.
[4] Bowditch, H. I., and Bosworth, A. W.: Trans. Amer. Ped. Soc., 28, 114.

ANTHRAX AS AN OCCUPATIONAL DISEASE IN MASSACHUSETTS.

By Thomas F. Harrington, M.D., Boston,

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Human anthrax has suddenly become a serious industrial, as well as a public health problem in Massachusetts. Hides, skins, wool, bristle and other animal products that formerly went to Europe are today exported direct to the United States. A large quantity of these imports comes from places where animal anthrax is constantly epidemic, namely, China, Asia, India, Africa, South America and Australia. The number of cases of human anthrax reported to the State Board of Labor and Industries in Massachusetts has increased from four cases in 1914 to twenty-seven cases during 1915-16. There have been forty-six cases reported in 1917 prior to November 1. Eight of these cases have been fatal. Between the dates July 1, 1915, and November 1, 1917, there have been seventy-seven cases, with fourteen deaths.

Anthrax is primarily a disease of animals, from which it is contracted directly or indirectly by human beings. It is particularly common among cattle, sheep, horses, hogs and carnivora, in the order named. Domestic fowl (probably most birds) and the cold-blooded animals are not susceptible. Infection in the herbivorous animals takes place usually through food (fodder) or water containing anthrax spores. This food becomes contaminated by being grown on anthrax-infected soil, usually by the decaying of an unburied carcass, from which bacilli are spread by dogs, birds and insects. Superficially buried infected carcasses may contaminate surface soil by means of ground water or worms.

Anthrax may be transmitted to man by infected hides, skins, wool, horse hair, cow hair, goat hair, pigs' bristle or pigs' wool, as well as by dried blood, bones and other animal products. The bacillus of anthrax soon dies out when dried at the ordinary temperature, but the *spores* of the disease may remain active under favorable circumstances for many years. These spores, enclosed in blood clots, dry, and getting on the hair, skin or wool, are the usual source of infection, owing to the clots breaking up into dust. The dust from the handling, sorting and manipulation of the animal products readily finds its way into the lungs in breathing, or is swallowed in the act of eating or drinking. More often, however, the dust finds its way into broken skin by cuts, bruises or scratched pimples. The result of this infection is anthrax. Anthrax, therefore, is chiefly a dust disease. (It can be caused by eating diseased meat and by the bite of an insect which has fed upon infected carcasses or other material.) While the danger of anthrax is greatest, according to all statistics, in the manipulation of animal products imported from China, Russia and Siberia, nevertheless the disease is so widely distributed that in no country is it unknown. Consequently the precautions which are most necessary where hides, skins, hair and wool from the countries named are handled, can with advantage be applied to products from other countries. In the United States there is no interstate quarantine law against anthrax.*

The intestinal form of anthrax is rare in man and is caused by eating infected food (sausages) made from the meat of infected animals. This form of anthrax, however, is more apt to be due to eating with hands not properly cleansed after handling infectious material. Not infrequently it is due to swallowing with the saliva dust infected with anthrax.

Intestinal anthrax is very fatal and seldom diagnosed ante mortem. (See Case 1.)

The pulmonary form of anthrax is familiar in textbooks as "wool-sorters' and rag-pickers' disease." The mortality of this form of anthrax is about 50%.

The external form of anthrax is the common type met in industrial life. This may be malignant pustule form (see Case 9) or malignant edematous type (see Case 7) or erysipelatous (see Case 10).

The symptoms of external anthrax vary greatly in their severity and progress. The disease begins usually very mildly, with little or no pain, and is seldom noticed by the patient at the early stage. A red, hard pimple about the size of a pinhead forms, usually at the point of inoculation (usually a scratch). There may be itching and slight redness. The pimple rapidly increases in size and becomes vesicular, surrounded by a marked swelling, often of considerable extent, which gives it the name of anthrax edema. In the center of the pustule there is a black spot discharging a bloody serum. Within thirty-six hours a dark brownish eschar forms. The black appearance of the pustule won for anthrax the French name of charbon. This stage is very characteristic of the disease. On the third or fourth day the lymphatic glands in the vicinity of the pustule are usually swollen and painful. In case of neck infection the inflammation may attack the larynx and endanger respiration. (See Case 4.)

The usual case of anthrax is uneventful—except the local symptoms. Severe attacks are marked by fever. In critical cases the patient complains of weakness, pain, and at times delirium ensues. If the bacilli get into the blood stream a condition of general septicemia occurs. The complete cycle of the disease takes from nine to ten days. Some cases are quickly fatal, other cases of anthrax escape notice until the eschar forms (characteristic) or are diagnosed post mortem.

In the external malignant edema form of anthrax, pustules may be absent (Case 7). The edema extends rapidly to eyelids, neck and arms. This may occur without redness, pain, distress or fever.

The internal form of anthrax is relatively rare. There are no characteristic symptoms and the diagnosis is a "surprise of the autopsy." (Case 1.)

In gastro-intestinal anthrax the course is usually one of sudden onset, with pain, distress and general weakness, followed by vomiting, colic, distention and diarrhea; later cyanosis, collapse, and at times tetanus-like convulsions precede death, which usually occurs from two to five days after onset of first symptoms.

Pulmonary anthrax (wool-sorters' disease) is characterized by extreme weakness, headache, profuse perspiration, dyspnea, cyanosis and edema of the lungs. This form lasts from four to eight days, but at times death is sudden and unexpected.

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* The U. S. Bureau of Animal Industry requires a certificate [illegible] the Consul at the country of export stating that the hides [illegible] [illegible] at the [illegible]

Human anthrax is usually of occupational origin, transmitted to the workers directly by animal products. Besides direct contact-infection by farm laborers, butchers, veterinarians and others handling diseased animals or their carcasses, the occupations most exposed to infection are those in which hides, skins, leather, wool, animal hair, bristle, horn, bone and dried blood fertilizer are handled.

The most notable instances of non-occupational anthrax are those associated with infection through shaving brushes in which the anthrax spores on the bristles survive the process of manufacture. Also cases of human infection by washing overalls worn by men in hide and leather industries have been reported.

The following are typical cases taken from the records of the Massachusetts State Board of Labor and Industries:

Case 1. Internal anthrax—fatal. The daily papers reported that a man, age 50 years, employed as a 'longshoreman, died on the previous day at the hospital from arsenic poison, contracted from handling hides. Investigation furnished the following history:

Man entered the hospital in a moribund condition on July 4 and died within a few hours. The diagnosis was edema of the lungs, multiple contusions and abrasions. An autopsy was secured and the medical examiner's report stated as cause of death—"internal anthrax. The nature of the disease which caused W.'s death was disclosed only by autopsy. Investigation showed that on May 25 he worked in the hold of a vessel laden with dried blood, ground bones and phosphate, and subsequently to that date assisted in the discharge of cargoes of dried hides."

It was learned later that the man was taken ill on June 30 and was not able to work July 1. On July 3 he complained of headache, and on the morning of July 4 was found unconscious on the floor of his room. He was removed to the hospital and died at noon July 4.

Case 2. External anthrax—wool infection. A boy, 16 years of age, employed as a sweeper in the weave room of a carpet mill, developed a suspicious-looking ulceration on the face, which on investigation gave a positive smear of anthrax and later developed a typical pustule. This boy worked in the machine shop and was also sweeper in the weave room, sweeping the "fly" of wool from the weaving machines and packing it into bags. The carpet is woven from jute and wool. The superintendent reported that the boy had been caught sleeping two or three times in the bags of wool. This wool came from South America principally.

Case 3. External anthrax—fatal. Man, 31 years of age, employed as a tanner in the fleshing department of a tannery, developed a swelling of the right upper arm on November 20. Was admitted to the hospital on that day and positive diagnosis of anthrax secured. Case progressed to marked edema of the neck, with death on November 27.

Case 4. External anthrax—fatal. Man, 33 years of age, employed as a currier in a leather establishment, was struck on the side of the neck with a piece of leather on March 4, scratching the skin. That evening he noticed considerable swelling surrounding the point of infection. The swelling spread during the night and next day to the neck and face with considerable tenderness of the whole left side of face, neck and chest. On March 6 swelling had extended to the chest. Smear showed positive anthrax. Man died on March 9.

Case 5. External anthrax—multiple lesions—rare. Man employed in handling hides as they came from lime pits where they had been soaked for six days. He had worked at this occupation for three years, but had recently been assigned to the handling of a cargo of China hides. On August 9 complained of malaise, headache, general weakness and had some fever. On August 11 slight glandular enlargement of the neck. Visited a physician who discovered eight lesions on neck, cheek and forehead, all of which went through the typical stages of anthrax vesicles and pustule, giving a positive diagnosis of anthrax. Man stated that he had been uncomfortable for about thirty-six hours, otherwise no marked effects of the infection.

Case 6. External anthrax—typical case. Man, twenty-four years of age, employed for three years in stamping raw hides. His duties consisted in lifting hides from floor, weighing them, and placing them on machines that stamped them. He does not admit having carried hides on shoulder or in contact with the neck. On March 20 he noticed small, tender pimple on left cheek. No history of previous scratch or pimple. Swelling grew very tender. Was admitted to the hospital March 20; symptoms of slight sore throat, stiffness of left side of neck, left arm and top of left chest painful, glands in left axilla swollen and tender. Positive diagnosis of anthrax confirmed. Suspected lesion was an abrasion of the finger and caused by moving the balance on the scales in weighing the hides. Recovery.

Case 7. Edematous anthrax—fatal. A man, 52 years of age, employed in a tannery on a fleshing machine, reported to the factory physician on May 31, at 5.30 o'clock p.m., because of a suspicious pimple on the neck near the right angle of his jaw. This was not pustular, was not gelatinous, and had no eschar. The man was seen at eight o'clock a.m., June 1. Pustule was not typical, swelling had extended from right to left neck and down over right chest. At right angle of jaw two small ulcers, yellow crusted, had formed. Sent to the hospital for diagnosis. During the afternoon and evening much edema developed, and on June 2 the edema became so marked as to cause dypsnea by pressure on the trachea. At two o'clock p.m., June 2, while drinking a glass of milk, man choked and became so cyanotic that tracheotomy was performed. Man died at 3 p.m. Positive diagnosis of anthrax from smear.

Case 8. External anthrax—indirect infection. A man, 41 years of age, employed in the tan room of a leather factory, developed symptoms of anthrax, with a lesion developing on the hand two days later. There was no previous case of anthrax in this department. His duties consisted in handling a truck carrying hides from beam house into the room where tanning is done. These hides had been subjected to a thorough soak, had been fleshed and split, also soaked in lime before being placed upon a truck for transferring to the tanning department. The most probable source of infection in this case would seem to be from spores of anthrax on the sides of the truck, thereby infecting the man using this truck. Typical course of anthrax, positive diagnosis.

Case 9. Malignant pustule form—fatal. Man, 64 years of age, employed as a brush-maker in sorting over quantities of horse hair and bristle recently received from China, developed on April 8 a typical anthrax pustule covering two-thirds area of lower lip and right chin. Pustule most virulent at the edge of mucous membrane. The pustule was excised on April 12, followed by much edema and enlargement of the glands, coma and death on April 14. Lesion showed anthrax bacillus.

Case 10. Erysipelatous anthrax. Man, fifty years of age, employed in a currying shop of a tannery, consulted the shop physician on March 31 for a mild conjunctivitis of the left eye of two days' duration. There was a slight reddened area below left eye, very slight edema. On April 1 the swelling and redness had extended over the whole side of the face, closing completely the left eye. Temperature 101. Later in the day the edema extended to the neck, and there was some involvement of right eye. No typical lesion could be found. On April 2 the smear from the conjunctiva showed typical bacillus of anthrax. Recovery.

Case 11. Wool-sorters' anthrax—fatal. Man, 52 years of age, employed as a wool-sorter, consulted the physician at his office on March 21, because of a skin eruption. Examination found swelling on the left side of neck extending towards the sternum. Temperature 102, pulse 110. Next morning swelling had increased greatly, extending to right neck. Patient complained of violent headache. Temperature 103, pulse 120. What was thought to be a pimple on the neck was burned with pure carbolic acid and corrosive poultices applied. March 24 patient was seen again. Temperature had dropped to subnormal, marked collapse, cold hands and feet. Nurse reported a large bloody stool, patient conscious and rational. Died March 25. Inoculation into animals developed typical anthrax. The particular consignment of wool worked on by this man was recently received from New Mexico, and was of an extremely dirty grade.

The State Board of Labor and Industries has prepared and distributed to the various trades and occupations in which anthrax is a possible source of infection a set of rules and regulations for the prevention of this disease.[*] These rules consist chiefly in preventing the carrying of hides on shoulders or against bare arms and neck, the supplying of gloves for workmen engaged in handling hides, and gauze masks for workmen employed in dusty processes of manufacture, in which infection from anthrax dust is a possibility. Separate washing and dining apartments and regulations for shop sanitation form a part of these rules. Employees and employers in the various industries named are cautioned about disregarding any cut or scratch or pimple, however insignificant or slight in appearance.

A SERIES OF FRACTURED SKULLS FROM THE SURGICAL RECORDS OF THE BOSTON CITY HOSPITAL, 1902-1917.[*]

By Carl Thorburn Harris, M.D., Boston, and Harry Archibald Nissen, M.D., Boston.

[From the Third Surgical Service and the Fourth Medical Service of the Boston City Hospital.]

This is intended as a preliminary statistical study of fractured skull cases during the years 1902-1917. It is to be remembered that the clinical material of the Boston City Hospital is drawn from all parts of Boston, and that admissions include a large proportion of the police ambulance and severe industrial accident cases.

The diagnosis of fractured skull was made 540 times; in 330 cases it was definitely proved by palpation, x-ray and operation or autopsy. This preliminary paper deals only with these definitely proved cases. The records were not as complete in most cases as we should like them, so that in some records, age, sex, etc., were not noted.

The frequency of fractured skulls is tabulated in decades in the following table:

	Operated		Non-Operated	
1st decade	Relieved....	15	Relieved....	17
	Dead.......	7	Dead.......	17
2nd decade	Relieved....	8	Relieved....	9
	Dead.......	9	Dead.......	3
3rd decade	Relieved....	7	Relieved....	13
	Dead.......	5	Dead.......	8
4th decade	Relieved....	12	Relieved....	25
	Dead.......	5	Dead.......	9
5th decade	Relieved....	9	Relieved....	24
	Dead.......	11	Dead.......	14
6th decade	Relieved....	2	Relieved....	6
	Dead.......	4	Dead.......	8
7th decade	Relieved....	1	Relieved....	6
	Dead.......	3	Dead.......	1
8th decade	Relieved....	0	Relieved....	1
	Dead.......	0	Dead.......	2
9th decade	Relieved....	0	Relieved....	2
	Dead.......	1	Dead.......	1

The causes as given in the records are collected under the following heads:

Accident	271	cases
Alcohol	60	"
Suicide	8	"
Assault	15	"
Unknown	1	case

A number of cases were combinations of alcohol and accident or alcohol and assault. In such cases both causes are given under separate heads.

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[*] Industrial Bulletin No. 6. Rules and Regulations Suggested for the Prevention of Anthrax. Copies furnished free on application, 7 Beacon Street, Boston.

[*] Presented at the September monthly clinical meeting of the Boston City Hospital House Officers' Association

The type of injury in the 330 cases is shown in the following table:

Simple fractures	186 cases
Compound fractures	147 "
Depressed fractures	114 "

Below are given the results of the operated and non-operated cases:

Operated cases	123	48.7%
Relieved	60	
Dead	63	
Non-operated cases	207	51.3%
Relieved	114	
Dead	93	

Below is given the time of death after operation:

	Cases
Operated and died within 3 hrs. after entrance	27
Operated and died within 24 hrs. after entrance	13
Operated and died within 3 dys. after entrance	7
Operated and died within 7 dys. after entrance	8
Operated and died several weeks after entrance	8

Cause of death in those cases which died from one to several weeks after operation was due to septic meningitis, erysipelas, pneumonia, brain abscess, or delirium tremens.

Special diagnostic work, as recorded in the past few years, is as follows: Blood-pressure findings were recorded in 39 cases. X-ray findings were recorded in 48 cases. Lumbar punctures were recorded in 11 cases. Fundi examinations were recorded in 33 cases.

It seems best to the authors to divide, in an arbitrary manner, the fractures, first as to location and second as to the two classes of simple and compound fractures. The classification as given below, of fractures of the frontal, parietal, temporal and occipital bones, does not mean that the fracture was of necessity confined to that bone alone, but that the larger part of the fracture was in that region.

I. Fractures of Frontal Bone.

Simple	13	Operated	6	Relieved	6
				Dead	0
		Not operated	7	Relieved	4
				Dead	3
Compound	49	Operated	17	Relieved	12
				Dead	5
		Not operated	32	Relieved	24
				Dead	8

Total ..... 62, or 18.8%.

Many of the fractures of the frontal bone are found to be only of the outer table, breaking through into the frontal sinus. A large proportion of the compound fractures is of this type. Operation as given means a decompression, and not the simple cleansing and suturing of a scalp wound, although such a wound may extend to the line of fracture. The cases of a simple fracture of the frontal bone requiring operation were all those in which a definite depression was felt or shown by radiograph.

II. Fractures of Parietal Bones.

Simple	60	Operated	24	Relieved	11
				Dead	13
		Not operated	36	Relieved	20
				Dead	16
Compound	59	Operated	32	Relieved	15
				Dead	17
		Not operated	27	Relieved	15
				Dead	12

Total ..... 119, or 36.0%.

These fractures might be classified as fractures of the vault. As a rule, the compound fractures were those which required immediate operation or at least within 24 to 36 hours after time of injury. The simple fractures, for the most part, unless a definite depression was made out, were operated upon at a time varying from 36 hours to 10 days. This was done only for definite signs of increasing intracranial pressure, *i.e.*, increasing blood pressure, nausea, vomiting or choked disc, or for focal signs due to pressure over a motor area. Among the children many of the fractures of the vault were of the "cracked egg-shell" type. These latter are included under the head "not operated," "dead."

III. Fractures of Temporal Bones.

Simple	32	Operated	14	Relieved	7
				Dead	7
		Not operated	18	Relieved	10
				Dead	8
Compound	18	Operated	9	Relieved	5
				Dead	4
		Not operated	9	Relieved	3
				Dead	6

Total ..... 50, or 15.1%.

Bleeding from one or both ears is not considered as diagnostic of fractured skull in this group, or in fracture of the base. Many of these diagnoses were made by aural men who found definite fracture through the bony wall of the auditory canal.

IV. Fractures of Occipital Bone.

Simple	22	Operated	6	Relieved	0
				Dead	6
		Not operated	16	Relieved	9
				Dead	7
Compound	13	Operated	7	Relieved	3
				Dead	4
		Not operated	6	Relieved	6
				Dead	0

Total ..... 35, or 10.7%.

Fractures in the above list are those of the upper portion of the occipital bone, due for the main part to a crushing injury over a small area of the bone. The operative results are interesting in that but three out of thirteen cases recovered.

V. Fractures of Base of Skull.

Simple 55	Operated 7	Relieved..	1
		Dead.....	6
	Not operated.. 48	Relieved..	20
		Dead.....	28
Compound.. 9	Operated 1	Relieved..	—
		Dead.....	1
	Not operated.. 8	Relieved..	3
		Dead.....	5
Total ..... 64, or 19.4%.			

This gives, out of 330 cases, a total of 123 operated cases, of which 48.7% were *relieved.*

The decompressions have been divided into three definite groups:

a. Immediate at site of fracture, of which there were 78 cases. Thirty-six of these recovered and 42 died. A large number of these were operated for a compound fracture, either comminuted, depressed, or with extensive laceration of dura and brain.

b. Right subtemporal, until recently the operation of election for the relief of intracranial pressure in cases showing no localizing signs. Nineteen cases of this kind are recorded, 14 of which died and 5 recovered. One instance is recorded of a case discharged with a definite paralysis of the left arm following operation.

c. For localizing signs or symptoms, 13 cases, of which 4 died and 9 recovered. These for the most part were due to late development of signs from blood clot, lacerated brain or foreign body.

d. Occipital, 13 cases, 10 of which died and 3 recovered. All but one of these might be classified under immediate, but have been given a separate place due to the recent interest in the question of occipital decompression for fractures of the base, with increased pressure under the tentorium. One case was operated for definite localizing signs appearing three days after operation.

It seems of interest to note, in relation to prognosis, the mortality, considering the mental condition of the patient at entrance.

This table includes all cases in which the records state the mental condition of patient at time of entrance. The percentage of cases relieved is seen to be in inverse proportion to the change from normal mental condition of the patient.

Unconscious 112	Operated ... 52	Relieved	7	13.2%
		Dead...	45	
	Not Operated 60	Relieved	14	23.3%
		Dead...	46	
Conscious and irrational.. 50	Operated ... 21	Relieved	13	61.9%
		Dead...	8	
	Not Operated 29	Relieved	21	72.9%
		Dead...	8	
Conscious and rational.... 82	Operated ... 29	Relieved	24	82.7%
		Dead...	5	
	Not Operated 53	Relieved	45	84.9%
		Dead...	8	
Extreme shock...... 17	Operated ... 1	Dead...	1	
	Not Operated 16	Relieved	4	20.0%
		Dead...	12	

The original tabulation of cases and their findings offer facts which we have not discussed in detail, but wish to mention briefly.

The large proportion of the cases in which the pupils were dilated and fixed died, thus giving that one physical finding a fair guide to an unfavorable prognosis.

Some of the cases which were operated with the idea of a decompression had a small area of bone removed, usually subtemporal, and then the dura was left intact. These cases, as a whole, did badly, *i.e.,* pressure symptoms did not clear up rapidly if at all. The brain in one instance was found not pulsating, but the dura was not opened. In other cases pulsation of the brain began shortly after the dura was opened and the pressure relieved. Thus it seems necessary, for a complete decompression, to open not only the bone, but the dura as well.

Suture of the lacerated or incised dura was performed in several cases. The result was not satisfactory. Usually the dura could not be approximated. In one case a subdural abscess developed at this point, requiring subsequent operation. Later came a definite brain abscess, ending in meningitis and death.

A rubber tissue drain was inserted to the dura in several cases of clean decompression, *i.e.,* not for or following a compound fracture. There is no evidence that shows the relief of symptoms to be more rapid or complete following such treatment than in the cases closed up tightly after removal of a large bone flap with opening of the dura. The cases apparently indicating drainage due to bleeding not ceasing with relief of intracranial pressure were few in number. Infection followed with fatal results in several of these cases.

Our study of the above cases would seem to indicate: routine two-hour blood-pressure readings for the first 24 to 48 hours; lumbar puncture in all cases; fundus examination at time of entrance and at intervals indicated by the general condition; x-ray examination of all head injuries; withholding morphia until a definite diagnosis is made, and controlling of restlessness with bromides if possible; thorough neurological examination backed up and checked by consultation with neurological service.

There is a possibility of better operative results in fractures of the base by early recognition and relief of symptoms by extensive decompression, either tempo-parietal bone flap or occipital trephine.

The above series would indicate that operative results in view of prognosis are better in the first and fourth decades than at any other age.

REPORT ON THE TREATMENT OF MYELOGENOUS LEUKEMIA WITH RADIUM.

By Francis W. Peabody, M.D., Boston.

[From the Cancer Commission of Harvard University.]

Since the opening of the Huntington Hospital five years ago, 36 cases of chronic myelogenous leukemia have come under observation. Nineteen of these have died, and at the present time 17 cases are being more or less actively followed. The physician in charge of the group of patients with leukemia meets them on one afternoon a week at the Hospital. Patients are supposed to report weekly for general examination and blood examination, but those whose condition is satisfactory or who live at a distance may be excused from attendance at the clinic for two or three weeks at a time. Constant supervision is an important factor in the care of these patients, for it makes possible the institution of radium therapy when the earliest signs that it is indicated appear. Occasionally patients disappear for long periods, to return only when severe exacerbations of the disease have appeared. It is, of course, impossible to control all patients as carefully as would be desirable, but over half of the present group report with considerable regularity.

RESULTS OF RADIUM TREATMENT.

The results from the use of radium may be discussed from the point of view of its effect on the general symptomatic condition of the patient, on the splenic tumor, and on the blood picture.

Symptomatic Condition. One of the most striking results of radium therapy in this series of patients with leukemia has been the general clinical improvement. Without exception the cases treated during the last eighteen months (the duration of personal observation by the writer) have shown symptomatic improvement, and in some instances (15,274; 15,322; 16,161; 14,140) the change has been little short of remarkable. Patients who were at one time bedridden, extremely weak, pale, dyspneic, and apparently in a very serious condition, have regained their strength and have subsequently returned to leading a comparatively normal life. Almost all of the patients who have been closely followed during the past year and a half are at work or performing their usual household duties. The appetite improves, the digestive disturbances gradually become less, and weight is usually gained. Headache is often relieved, and buzzing, roaring or "beating" in the ears, a common and disagreeable symptom, frequently diminish, and are sometimes completely cured. In one instance with complete deafness (16,406), the hearing was not improved even after many treatments with radium.

The Spleen. When first seen the patients have a large, often an enormous spleen, but under the influence of radium a rapid decrease in size takes place. In many cases the spleen diminishes so that its lower pole is above the costal margin, and in some instances it has become so small as not to be palpable. Occasionally it may be impossible to reduce the size of the spleen so satisfactorily and it remains enlarged so that the lower edge is well below the ribs. In one case, (16,125) the spleen became greatly enlarged during a terminal exacerbation of the disease and continued so in spite of vigorous treatment until the patient's death. In general, the patients in whom radium therapy produces a decrease in the size of the spleen seem to be the most favorable cases for treatment. The shrinking of the spleen may be a rapid process and an organ which has filled nearly one-half of the abdominal cavity may disappear behind the ribs in the course of 8½ weeks and after 13 treatments (16,346).

The Blood. The most definite effect of the application of radium in myelogenous leukemia is on the blood picture. In cases which have received no previous similar treatment and which have a high leucocytosis, the number of white cells usually begins to fall in from 24 to 72 hours after the radium is applied. The decrease in the leucocytosis is often rapid and continues for days and even several weeks after the radium was administered. In one patient the white count dropped from approximately 100,000 to 6100 in 25 days, radium having been given on the first and thirteenth days only. Even more striking results have been observed in other instances. Associated with the decrease in the total leucocyte count there is a change in differential count. Myelocytes and immature forms of polymorphonuclear leucocytes become less prominent and a larger proportion of adult polymorphonuclear cells is found. Usually, however, careful searching will always reveal the presence of a limited number of typical myelocytes. Patients with an anemia, who respond well to treatment, show a rise in hemoglobin and in the red cell count associated with their improvement. On the other hand, the development of an anemia in a case under observation is to be regarded as a serious sign. A fall in hemoglobin and the occurrence of many nucleated red cells is of serious prognostic significance, but the picture may improve in response to radiation. An important point to bear in mind is that the development of anemia may be the result of too much radiation. It is almost certain that this took place in one patient (16,406) who died with a low white count (2000), and a hemoglobin of 10%. This case, which presented remarkable pathological lesions, will be reported in detail by Dr. Goodpasture.

While it is comparatively easy in most cases to bring the leucocyte count down to normal, it is much more difficult to keep it there. A remission usually takes place after a few weeks, and more radium must be applied. The attempt has been made to treat patients soon after the white count began to rise, and by prompt application of radium it is possible to keep the count at from 5000 to 40,000 or 50,000. Often the leucocyte count will remain within normal limits for weeks without any treatment. One patient (15,274) came into the hospital in January, 1916, with a bad clinical relapse and a white count of 248,000. His leucocytes were reduced to 6000 on February 29, 1916, and remained below 17,400 without any treatment until Nov. 23, 1916. In general there seems to be a close parallelism between leucocyte count and clinical condition. When patients report that they are feeling poorly the white count is frequently found to be high. This is not always true, however, and patients seem to do well clinically if their leucocyte count is not over 50,000. The white count, however, is the best routine guide to treatment, and the attempt is always made to keep it within normal limits. The intervals at which it has been necessary to administer radium have varied greatly from case to case in any given individual, but they have perhaps averaged one to three months.

In one of our cases a few applications of radium were made over the long bones, but in all other instances treatment has been applied over the spleen in the French manner used in this Hospital and recently described by Ordway in detail.[1] Our experience does not as yet enable us to state definitely as to the best dosage, but recent results have seemed to indicate that the administration of one or several large treatments, followed by an intermission of at least several weeks, until all evidence of radium action has ceased, is more satisfactory than the use of smaller doses at more frequent intervals. This, however, is a point which requires further study. Extensive radiation over the spleen often produces nausea which persists for one to four or five days, and in some instances vomiting occurs. The danger of excessive radiation has already been referred to. This is best avoided by not instituting new treatment until the effects of the last treatment have completely subsided, and by watching carefully the hemoglobin and red count as well as the leucocyte count.

When, under the influence of radiation, a large splenic tumor decreases in size rapidly it is to be expected that profound changes in the metabolism and in the excretion of waste substances in the urine will take place. The opportunity was therefore taken to study as thoroughly as possible the metabolism in one of our cases. The patient was in the wards of the Peter Bent Brigham Hospital and was kept on a carefully calculated constant diet for a period of nearly forty days. Frequent observations were made on the gaseous exchange, and on the various constituents of the blood, and daily analyses of the urine were carried out. The results of this study will form the basis of a separate communication.

It is too soon for us to make any final statement as to the effect of radium therapy on myelogenous leukemia. In spite of the comparatively large number of cases which have attended the clinic, only a few can be regarded as having been thoroughly or satisfactorily treated, and the natural duration of the disease is so variable that it is quite impossible for one to know whether or not the length of life has been influenced. It is, on the other hand, quite certain that temporary remissions of the disease have been brought about, and that patients who were in a most distressing and apparently serious condition have been restored to a useful and functionally efficient existence.

REFERENCE

[1] Ordway: BOSTON MED. AND SURG. JOUR., Vol. clxxvi, No. 14, April 5, 1917, p. 490.

OBSERVATIONS AT THE PETER BENT BRIGHAM HOSPITAL ON CASES OF PNEUMONIA IN RELATION TO TYPES OF PNEUMOCOCCI AND THE SERUM TREATMENT OF TYPE 1 CASES.*

BY H. L. ALEXANDER, M.D., BOSTON.

[From the Medical Service of the Peter Bent Brigham Hospital.]

FROM July 1, 1913, when the medical wards of the Peter Bent Brigham Hospital were opened, until April 15, 1917, 210 patients were recorded with the diagnosis of lobar pneumonia. The individuals thus represented were characteristic of those in the average general hospital, in which no particular type of individual dominates, although but few children were admitted. Excluding terminal pneumonias, questionable cases and pneumonias of infants and young children, 23 in all, many of the cases were grouped according to the classification worked out at the Rockefeller Hospital,[1] and we are indebted to that institution for our immune serum. Of the 187 cases considered, 104 were grouped. Such work was done periodically when available men could devote time to it, and some selection of cases was made, in that very mild cases, those having crises on admission and cases in children were frequently neglected, as is manifested below by the mortality statistics of grouped and ungrouped cases. During the past winter all but two cases were classified according to their serum reactions. The following statistics were obtained:

	No. of Cases	Per cent	Survived	Died	Mortality
Group 1†	25	24.0	17	8	32.0%
Group 2	22	21.2	13	9	40.9%
Group 3	12	11.6	6	6	50.0%
Group 4	45	43.2	34	11	24.4%

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* Read at the meeting of the Association of American Physicians, Atlantic City, May, 1917.

† Group 1 cases not treated with serum—14 cases, with 42.8% of mortality. Group 1 cases treated with serum—11 cases, with 18.2% mortality.

The total mortality of the 104 grouped cases was 32.7%, whereas in 83 ungrouped cases this was 16.8%,—a combined mortality of 25.7%.

The incidence of cases in the several groups varied moderately from year to year. The notable exceptions were that Group 4 included 61.4% of the cases in 1914, and that during the past winter 9 Type 3 cases were encountered, several of which ran unusually mild courses. It has been suggested that sputa obtained in some of the latter instances may have been mouth specimens in which the occurrence of Type 3 organism is considerable,[2] but only one case is subject to such suspicion. Also it is possible that serum now employed in the determination of this group, which was not available in previous years, may detect these cases with greater accuracy.

	Group 1	Group 2	Group 3	Group 4	Total
1914	3	3	1	11	18
1915	6	8	0	16	29
1916	7	7	4	10	28
1917 (to Apr. 15)	8	4	7	8	27

Twenty-one positive blood cultures (22.6%) were obtained from 93 of the grouped cases, of which 15 (71%) occurred in fatal cases, whereas of the 72 patients with negative cultures, but 14 (18.9%) died. In 49 unclassified cases, 8 positive blood cultures (16%) were observed. Two of the patients yielded the bacillus mucosus capsulatus at autopsy.

No systematic effort was made to employ serum treatment until this past winter, when it was administered to all cases with Type 1 infection. These were treated as soon as the diagnosis was established, and large doses were given intravenously—at frequent intervals when necessary. The 11 patients so treated represented both mild and severe infections.

As a rule, a critical fall in temperature occurred within a few hours after serum infusion, followed usually by a slight rise, which could be controlled by serum. Frequently more than one treatment was necessary to reduce the temperature below 100.° Some cases, usually the more severe ones, showed a precritical rise of 2° or 3°, accompanied by a chill. In these instances, however, the subsequent fall was proportionately greater, in one instance 8°. Cases in which the disease was of short duration usually required but one treatment.

A cutaneous test, similar to the von Pirquet test, with horse serum protein, was done routinely before treatment, and in one instance this was positive, the patient reacting likewise to horsehair protein. Although ¼ cc. of serum, which was then given subcutaneously, induced a violent asthmatic attack, by the use of very small desensitizing doses (1/40 cc.), which were gradually increased until intravenous injections could be tolerated, he was eventually made to withstand 70 cc. of serum introduced intravenously and following serum treatment, recovered from his pneumonia. A second patient, with a history of asthmatic attacks, gave a negative skin reaction to serum protein, but had asthma immediately after treatment. He was subsequently found to be sensitive to horsehair protein. A more detailed discussion of these two cases will be found under the title "Asthma Complicating the Serum Treatment of Pneumonia," in the *Archives of Internal Medicine* of October, 1917.[3]

Serum sickness occurred in most cases about a week after treatment, although it was absent in the two asthmatics. This serum sickness was never very severe, no joint manifestations or prolonged course having occurred.

There was but one instance in which serum seemed to have no beneficial effect. This was in the case of a man of 54 years with a pneumonia of many days' duration, in delirium tremens, having intense bacteriemia and a white blood cell count of 4200. He was treated intensively with serum, but failed to rally. Another fatal case was that of a woman who responded to serum treatment, but during her apparent convalescence, after the temperature had been approximately normal for 6 days, died suddenly. Autopsy revealed a large thrombus in the right internal iliac vein, with an embolus lodged at the bifurcation of the pulmonary artery. She had manifested no signs whatever of phlebitis. A patient with a Type 4 infection showed evidences of thrombosis of the right subclavian vein; these being the only examples of this complication in the entire series of pneumonia patients. Two cases treated with serum No. 1 developed empyema.

The mortality of this treated series was 18.2% if the case dying of pulmonary embolism during convalescence is included. If this patient is not included as not having died as the direct result of the pneumonia, the mortality was 9.1%. This, when contrasted to the 42.8% death rate of Type 1 cases not receiving serum treatment, indicates the therapeutic value of antipneumococcus serum.

REFERENCES.

[1] Dochez and Gillespie: Jour. A. M. A., 1913, lxi, 727.
[2] Spillman, E. G.: Jour. of Exp. Med., 1916, xxiv, 651.
[3] Alexander: Arch. of Int. Med., 1917, xx, 636.

Medical Progress.

RECENT PROGRESS IN PHYSIOLOGY.

II.

By P. G. Stiles, Ph.D., Boston,

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A New Instance of Biological Adaptation during Excitement.—Two years ago Cannon summed up in a most interesting book[1] a number of physical changes which accompany emotional disturbances in men and animals. He was able to show in an impressive way that these changes are, on the whole, such as promote the welfare of the individuals which exhibit them. It was pointed out, first of all, that the normal occasion of excitement is an emergency calling for strenuous action. It was then made evident that the bodily changes in emotional crises confer on the subject the fullest command of its resources. The best possible preparation for either conflict or flight is promptly effected.

We may briefly recall some of the reactions thus shown to make for self-preservation. They include the following: stimulation of the heart, diversion of blood from the viscera to the muscles, increase of sugar in the circulation. These three clearly help to sustain muscular activity. In addition, there is an augmented production of adrenin, and proof has been furnished that this internal secretion postpones fatigue. The composition of the blood is so modified that its coagulation-time is shortened; this may be regarded as a defensive change. There is an involvement of the thyroid in the emotional syndrome also.

Now we can add to this list of adaptive changes another which seems equally advantageous. The observations are reported by W. E. and E. L. Burge.[2] These investigators have determined the catalase content of the liver in cats subjected to excitement and in control animals. Catalase is an enzyme which accelerates the liberation of oxygen from hydrogen peroxide. Its presence in most tissues is demonstrable, and it is natural to suppose that there is some correspondence between its abundance and the local capacity for oxidation. The experimenters thought that an increase of the liver catalase in consequence of excitement might be looked for. Their expectation proved to be well founded.

The young cats chosen for the trial were confined in cages and frightened or enraged by a noisy dog. The method is not new; there is no doubt that it is effective. It was employed on two successive days, then the cats, five in number, were killed with ether. The liver of each animal was ground up and the catalase determination made with one gram of the finely divided material. Results are stated in terms of the number of c.cm. of oxygen gas set free from 700 c.cm. of H_2O_2 solution in 10 minutes at 22°. The average quantity is given as 3036 c.cm.

Five control samples of liver substance were prepared from cats which had not been recently frightened or angered. The average volume of oxygen liberated under the influence of these samples is recorded as 1588 c.cm. The individual figures did not show a very wide variation—1400 to 1875. There can be no doubt that the emotional disturbance was attended by an increase of catalase in the liver, amounting apparently to 90%. Further evidence is furnished to show that this catalase enters the blood where it can be distinguished from that ordinarily present by certain specific properties. The natural inference is that at the same time when the liver glycogen is being resolved to furnish sugar for the muscles, an agent to promote oxidation of sugar is mobilized by the hepatic cells.

Experimental Findings and Pellagra.—In the course of the last few years there has been much discussion concerning the nature of pellagra. The claim that it is a "deficiency disease," having affinities with scurvy and beriberi has been constantly urged. On the other hand, the theory that pellagra is infectious has continued to have proponents. When a number of people who are closely associated suffer from a malady, careful observation may be required to determine whether it has been communicated from one to another or whether it has resulted from similar living conditions obtaining for all the victims. Beriberi has come to be referred confidently to the diet; a decision in case of pellagra has seemed more difficult.

Chittenden and Underhill[3] have recently presented a body of evidence favorable to the view that pellagra is a deficiency disease. They have produced in dogs a pathological state closely resembling it, and the controlling factor has been the food. The writers have been engaged for a long period in studies of nutrition. The records of their laboratory (in the Sheffield Scientific School) include detailed histories of hundreds of animals. The data for the present report are drawn in part from notes made ten or twelve years ago. New trials have been made to check the old.

The recognition of pellagra is not always easy. Its variations have been described as "protean." When the disease runs a typical course we have the alliterative catch-words, "diarrhea, dermatitis, delirium, death." Where there are a number of undoubted cases, dubious ones will also be found. The disorders exhibited by the dogs presented a very clear clinical picture with few individual variations. The diets tending to induce the disease were distinguished by the fact that boiled peas constituted the chief source of nitrogen. The symptoms were established sooner if no other proteins were supplied, could be deferred by including a small amount of meat, and quite prevented by more liberal supplies of animal food.

The disturbances were chiefly of the alimentary tract. After a time food was refused, apparently because of sore mouth. At the same period, or soon after, bloody diarrhea set in. The discharges were excessively foul; the same odor was on the breath. The mucous membrane of the mouth underwent free desquamation. After death, which soon supervened the buccal lining was beset with pustules, and there was a general congestion of the intestinal wall. In a few cases, which had been marked by convulsions toward the end, there was definite ulceration of the duodenum.

The paper of Chittenden and Underhill is of particular interest because it shows so clearly that the disease produced was due to the lack of something and not to positive poisoning. If the boiled peas were harmful, the symptoms would have been aggravated by increasing the ration. But the fact was that more liberal supplies of the food postponed the ill effects. It is natural to conclude that, whatever the nature of the valuable substance, it is present in the peas but too scantily to meet the requirement.

"Are Schoolrooms Drier than Deserts?"—This is the title of a paper by Palmer,[4] the chief of the Investigating Staff of the New York State Commission on Ventilation, a board that has published much of interest. Students of hygiene have emphasized very strongly in recent years the possible ill effects of excessively dry air. Rooms which are artificially heated are often extremely dry. The relative humidity or percentage of saturation in such places may be represented by figures as low as 30 or even 25. It has been claimed that such atmospheres damage the linings of the nose and throat, partly because of the rapid abstraction of moisture from the membranes and partly, perhaps, because dust is easily raised and kept floating when such conditions prevail.

Desert humidities have been reported all the way from 19 to 46%. If these numerical values are final criteria, we must conclude that schoolrooms are indeed as arid as deserts. Palmer proceeds to point out that we cannot fairly use this single standard as a measure of dryness. When we say that a room is dry we mean that it is a place where rapid evaporation occurs. We base our judgment, very likely, on the feelings associated with hands, lips, eyes, and nostrils. Now evaporation from these moist surfaces does not depend solely on the relative humidity of the atmosphere. It depends on temperature and on air currents as well.

There is seen to be an important difference between dryness of air, in the literal sense of limited moisture content, and the *drying power* of air exerted upon wet bodies. To measure the latter we may have recourse to the katathermometer of Leonard Hill. Or we may use the instrument described by Palmer under the name of the atmometer. The principle involved is the determination of the amount of water evaporated in a unit of time from a unit area of a porous, saturated surface. The quantity will be duly influenced by temperature, humidity, and movement of the air. It is well stated that the human body differs from artificial instruments for measuring evaporation because it does not maintain a saturated surface. Dryness of the skin may be due to restricted secretion, as well as to excessive vaporization. The former is felt in cold, the latter in hot, breezy weather with low humidity.

When desert and schoolroom conditions are compared, the desert is found to have the greater dehydrating effect, in spite of similar relative humidity. The higher temperature is, of course, a factor. When the movement of the air is estimated, a great contrast is apparent. The average current indoors is only 25 feet per minute, against 500 feet per minute in the open. With great insight, Palmer suggests that while the desert air is undoubtedly more drying to the skin, it is quite possible that the schoolroom air is more drying to the nasal passages. This is because the temperature within the nose is nearly constant and the air-currents are those of the breathing, and independent of the environment. Relative humidity should thus be the only differential.

The Cerebrospinal Fluid.—The amount of recent literature upon this subject is strikingly large. An interesting summary is afforded in an address by Halliburton[5] before the Section of Neurology, Royal Society of Medicine. The fluid in question is now held to be a true secretion elaborated by the epithelial cells of the choroid plexus within the cerebral ventricles. That it has this rank is shown by its composition, which is markedly unlike that of ordinary lymph, and by the fact that its pressure does not vary directly with that of the blood. The fluid occupies but a small space, yet all the evidence tends to show that its formation proceeds steadily; of course there must be a corresponding withdrawal from the narrow confines of the meninges. The depletion appears to take place into the venous sinuses by way of the arachnoid villi.

The barriers between the cerebrospinal fluid and the blood exhibit in a high degree the property of irreciprocal permeability. That is to say, transfers of many dissolved substances from the cerebrospinal fluid to the blood take place with great freedom, while the opposite movement, from blood to cerebrospinal fluid, is nearly an impossibility. Such a drug as adrenalin introduced into the sub-arachnoid space exerts its full effect almost as promptly and clearly as though the injection had been intravenous. Less diffusible compounds do not find their way to the circulation so readily, a fact which is held to prove that there are no actual openings into the cranial sinuses from the meningeal spaces, as was once believed.

The cerebrospinal fluid has often been described as the lymph of the brain. When it is compared with lymph as found elsewhere, we are impressed with its poverty in proteins and in formed elements. The obvious suggestion is that what we call the secretory property of the cells in the choroid plexus is not so much the capacity to add new compounds as to keep back the abounding proteins of the blood. The secreting cells of the sweat-glands have a somewhat similar action.

The speculative part of Halliburton's paper has to do with the question why proteins should be excluded from the cerebrospinal fluid. The writer reminds us of the use of Ringer's and Locke's mixtures in our laboratories. These are substitutes for lymph or blood-plasma, the first inorganic, the second containing a small percentage of dextrose. We have not found it at all advantageous to add proteins to such mixtures. Halliburton conceives the cerebrospinal fluid to be a Locke's solution of exquisitely balanced constitution. It is the medium best suited to the maintenance of the nerve-cells and the support of their activities. Provision is made for its rapid renewal, so that fresh portions are continually brought to bear upon the elements of the cortex.

Finally, it is suggested that the brain-cells need to be shielded from proteins because toxins belong to this class of compounds. When bacterial poisons are abroad in the circulation, and the organism is contending against them, it must be a great advantage to have the environment of the central neurons protected from their approach. We may suppose that this protection is secured, in a measure, by having the cells of the choroid plexus impervious to proteins. Being so constituted as to hold back the colloids of normal blood, they are also proof against the passage of toxins. It is pointed out that this impermeability of the choroid plexus must be reckoned with in choosing therapeutic agents designed to operate in the brain, particularly in treating syphilis.

One-sided Permeability.—It will be well to follow the foregoing review with a reference to an article by Robertson.[6] The so-called selective power of cells by virtue of which they receive certain dissolved substances and reject others is of the greatest interest. It is related equally to problems of secretion and absorption. A question which immediately arises is whether living cells showing such a power apply metabolic energy of their own to the transfer of molecules. This has generally been held to be the case with the kidney. How far can selective behavior be maintained on a structural basis alone? The studies of Clowes, Osterhaut, and others are throwing much light on this matter.

Before we can hope to understand the complex subject of selective absorption, we must master the more elementary facts of one-sided permeability. It is known that many membranes composed of living cells act in totally different ways upon fluids brought in contact with one or the other of their surfaces. Thus the intestine absorbs a solution of dextrose from its lumen without returning to the same cavity more than a trace of the sodium chloride of the blood. The external surface of the intestine cannot absorb dextrose from the peritoneal cavity without returning salt. We are wont to pass over such facts with the simple statement that the mucous membrane is specialized for absorption, while the serous surface is not. This is not an explanation.

Robertson shows that the structural peculiarities of protoplasm which determine its permeability must be of a submicroscopic order. It is natural to assume that a leading feature must be the relation of the lipoids to the water-soluble constituents. We know that the state of the fatty components may change quickly. At one time they may be in globules demonstrable with the microscope, at another they may be quite invisible and yet undiminished in amount, as analysis will show. Permeability is almost certain to change with such alterations in the character of the protoplasm.

If, for example, the lipoids should form a continuous film at the surface of a cell, complete impermeability to substances dissolved in water might result. If the fats should separate in relatively large globules the interstices might offer free passage to all kinds of water-soluble compounds. If the lipoids should form an aggregate composed of ultra-microscopic globules, the layer might be a literal molecule sieve. The pores between the fatty particles might be of an order of magnitude to permit the ingress of certain molecules, while keeping others back. A selective absorption could thus be manifested, and its characteristics would be changed by any circumstance affecting the state of lipoid aggregation.

Robertson passes from these considerations to the more difficult subject of one-sided permeability. He suggests that we consider the following hypothetical type of organization. The fatty material near the absorbing surface of the cell is so arranged as to enclose conical portions of the water phase, the bases of these minute cones being outward. The apices of the cones, pointing inward, are not mathematical points, but are like the stems of funnels leading into the interior of the cell. These stems are of such diameter as to transmit certain molecules in preference to others. The expanded bases of the cones will absorb dissolved substances freely and the apices will discharge the absorbed molecules into the deeper regions.

Such a mechanism will not operate in the reverse fashion. Diffusing molecules will fail to enter the "stems of the funnels" in appreciable numbers. The following crude comparison may help one to visualize the principle. Imagine 100 flower-pots standing upright and, nearby, an equal number inverted. If a shower beats upon the pots it is easy to appreciate how much more water will be collected by the upright group than by their neighbors which present only small openings to the pelting drops. The second set are relatively "impermeable" as they stand, but are capable of becoming so if turned over. Technically speaking, all flower-pots have one-sided permeability.

These conceptions of a structural basis, correlated with peculiarities of secretion and absorption, are in the highest degree clarifying. But it would be hasty to conclude that all the problems in this field can be readily solved by such devices. Sieves with conical orifices may account for some instances of selective action and cellular polarity. Many other factors must be invoked to explain other cases. We must not forget that the cells of the intestinal wall receive sugar freely from the lumen but refuse to absorb highly diffusible compounds, like magnesium salts. It will be difficult to picture a sieve which will effect this result. Still, it is sound practice to make the most we can of mechanistic ideas, and Robertson's contribution is a welcome one.

The Light of the Firefly.—The preceding abstracts have presented subjects of more or less direct interest to the physician. It may be permissible to report some observations which are not so closely related to his primary concerns, but which illustrate the breadth of the field in which physiologists are at work. One of the most curious manifestations of metabolic energy is the light production exhibited by the firefly and other organisms. Scientists have been stimulated and baffled by it. They have thus far failed to discover the means of producing light without heat, an achievement very nearly compassed by the luminous insect. Yet much has been learned about the conditions of such light production, and attention may be called to a recent paper on the subject by Harvey of Princeton.[7]

It has been possible to prepare from the luminous parts of several species two chemical compounds which are individually non-luminous but which emit light when mixed in solution. The presence of oxygen is necessary for the reaction. Of these two compounds, one is indiffusible and readily destroyed by heat; Harvey calls it *photogenin.* The second is capable of dialysis and thermo-stable; it is termed *photophelein.* The investigator set himself to find out which of these two bodies should be regarded as the fuel evolving the light. A satisfactory solution of this question proved possible.

There are two common species of firefly; one of these produces an orange, the other a greenish light. Harvey prepared separately the *photogenin* and the *photophelein* of the two. He then found that when he mingled the unstable, colloid substance of one species with the stable, diffusible product of the other the resulting light had the color proper to the species furnishing the first-named material (*photogenin*). The colloid, accordingly appeared to be the fuel and to be appropriately named. Why is energy released when these two compounds are brought together? It might be thought that the *photophelein* should be regarded as an oxidizing enzyme, but Harvey inclines to a different conception.

He shows that a number of other reagents besides the natural one, *photophelein,* will cause a solution of *photogenin* to emit light. These artificial substitutes have one common character: they are cytolytic agents. This, then, may be the essential property of *photophelein.* The solution in which it does its work does not, indeed, contain cells nor protoplasmic fragments of any appreciable size. But it does contain colloid aggregates which can be disintegrated by a process akin to cytolysis. Such disintegration means multiplication of surface and the development of conditions favoring the reaction with oxygen.

REFERENCES.

[1] Cannon: "Bodily Changes in Pain, Hunger, Fear and Rage," Appleton, 1915.
[2] Burge, W. E., and E. L.: Am. Journal of Physiology, 1917, xliv, 75.
[3] Chittenden and Underhill: *Ibid.*, 1917, xliv, 13.
[4] Palmer: Presented to the Chicago meeting of the American Society of Heating and Ventilating Engineers, July, 1917.
[5] Halliburton: Proc. Royal Society of Medicine, 1916, x, Section of Neurology, 1.
[6] Robertson: Science, 1917, xlv, 567.
[7] Harvey: Science, 1917, xlvi, 241.

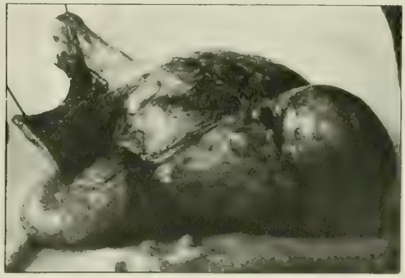
Clinical Department.

UNUSUALLY LARGE HYDROSALPINX: REPORT OF A CASE.

By L. E. Phaneuf, M.D., Boston.

This case proved interesting, not on account of its rarity, but from the standpoint of diagnosis.

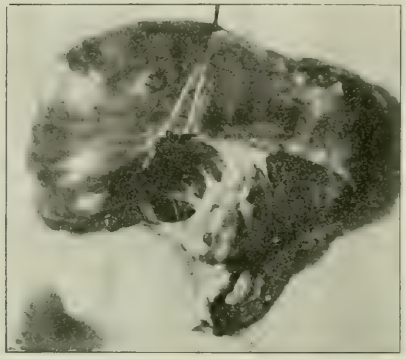
Miss M. S., 26 years old, machine operator. Born in Russia. Admitted to the Carney Hospital, Gynecological Service, April 19, 1916. *Complaint*—Pain in the right lower abdominal quadrant, sharp and severe in character. *Family History*—Negative. *Previous History*—Negative. *Menstrual History*—Onset at 13 years of age, regular, every four weeks, flow profuse, very painful, duration three to four days. Last period two weeks ago. Previous period six weeks ago.



Left ovary and left tube. Weight, 3 lbs.

Present Illness—Previously well, until nine months ago, when she was taken with a severe, and sharp pain, in the right lower quadrant of the abdomen. During this time, the patient was employed at one of the local hospitals, where she was examined, and told she had appendicitis. The pain lasted two days, and disappeared; she had no nausea or vomiting at that time. She was free from pain until four days ago, when she had another attack, practically the same as the first; this time, however, the pain has persisted, and is more severe. No vomiting with the present attack; urination negative; appetite good; bowels very constipated; leucorrhea, slight; headaches, none.

Abdominal Examination—A large, oblong, cystic mass, free in the abdominal cavity, signs of fluid on percussion. This mass fills the right lower abdominal quadrant and extends above the umbilicus; it can be moved from right to left, feels symmetrical, and is resilient. Examination otherwise negative.



Right tube and ovary. Weight, 10½ oz.

Vaginal Examination—Outlet slightly relaxed, no sign of infection of urethra or vulvo-vaginal glands; cervix nulliparous, in good position. Uterus normal in size, in position, freely movable. There is a small mass the size of an orange in the right pelvis, none in the left. The large mass is out of the pelvis, and may be moved from side to side, and upwards and downwards. No marked tenderness on examination.

Pre-operative Diagnosis—Ovarian cyst with twisted pedicle.

Right tube and ovary. Left tube and ovary.
Combined weight, 3 lbs. 10½ oz.

Operation—Double salpingo-oophorectomy, appendectomy, resection of omentum, fixation of the uterus; gas-ether anesthesia, April 19, 1916. Median abdominal incision from symphysis to umbilicus. On opening the peritoneum a large mass was found free in the abdominal cavity. This was attached to the left broad ligament by a long twisted pedicle. The mass was the size and shape of an ordinary squash. The pedicle was unwound, clamped and resected. The mass was entirely tubal. The ovary was small and cystic, and was removed with the tube. On the right the tube was also enlarged, cystic and elongated. It was removed, together with a small cystic ovary. The large tube in making its way out of the pelvic cavity had perforated the omentum, and this tore easily in separating it from the tube. The torn portion of the omentum was resected. The appendix was not primarily involved. There were, however, two firm bands of adhesions to the right infundibulo-pelvic ligament. These bands were cut and the appendix was removed in the usual way. The uterus was normal. It was fixed to the abdominal wall by the Olshausen method, using silk sutures. Closure in layers. The large tube and ovary weighed 3 lbs. The small tube and ovary weighed 10½ ozs. Combined weight, 3 pounds 10½ ozs.

Pathological Diagnosis by Dr. Timothy Leary, *tubercular salpingitis.* The lining mucosa of both tubes was studded with miliary tubercles. Note.—No tubercles were found on the peritoneum, or intestines, at the time of operation. There was no free fluid in the peritoneal cavity.

Convalescence uneventful. Out of bed on the 12th day, May 4, 1916. Discharge Note—Abdominal incision well healed throughout, no tenderness, slight induration in the region of the silk fixation stitch on the right, none on the left. *Vaginal Examination*—Uterus in good position against the abdominal wall. No masses or areas of tenderness in the pelvis. Discharged improved. June, 1916, examination at my office shows no change except that the induration has practically disappeared. January, 1917, seen at her home. She feels well, has no pain, and is at work. August, 1917, reports she is well, and has had no pain since last seen.

X-RAY THERAPY IN TINEA TONSURANS (CHRONIC).

By Arthur R. Pillsbury, M.D., Wrentham, Mass.

The current trend of opinion for the eradication of ringworm of the scalp in young children by means of the x-ray is to substantiate faith in the massive dose method. The accompanying photographs (Figs. 1 and 2), however, show the comparative quick and successful healing of an inflamed papulous ringworm infected area and growth of healthy hair by a fractional dose method.

The infection was resistant to the ordinary parasitic agents, and the lesions previous to exposure of the x-ray remained active and contagious for months. Fig. 2 shows the same child after twelve to fifteen x-ray treatments, exposing the area for short periods twice a week. The extent of the x-ray dose may be measured by pastiles. An interesting feature in the study of twelve chronic cases was the concurrent microscopic examinations of infected hairs removed from the ringworm area. It was observed that as the treatment advanced, the num-

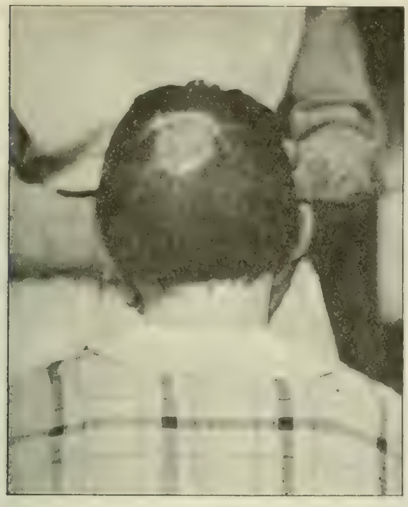


Fig. 1.

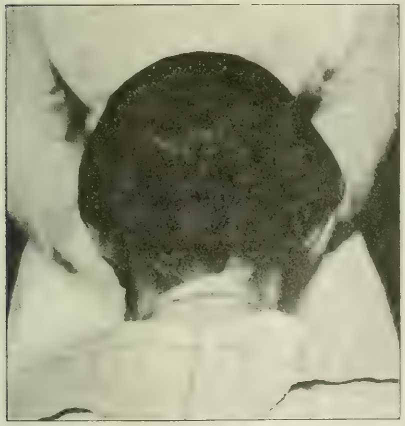


Fig. 2.

ber of microsporons and spored fungi lessened with each exposure. The comparative numbers of these bodies served as an index to the extent of the condition present. No appreciable epilation was observed in any of the cases after treatment was begun. But on the contrary, as the hair became more firmly rooted, instead of finding a broken off and branched condition of hair growing in the area, it approached the normal. Undoubtedly this method of eradicating ringworm infection where numbers of children live together, will prove successful.

Book Reviews.

A Treatise on Regional Surgery. By Various Authors. Edited by John Fairbairn Binnie, A.M., C.M., F.A.C.S., Kansas City, Missouri. Vol. I. With 351 illustrations. Philadelphia: P. Blakiston's Son and Company. 1917.

Dr. John Binnie, well-known throughout the United States and Europe, writes a brief and characteristic preface to this new three-volume textbook; the preface is only a trifle more than a half page in length, and deserves to be quoted almost in full. The following paragraph gives an idea of the scope and plan of the work:

"The aim of the present work is to present short treatises on the injuries and diseases of the different regions of the body.

"To each of the authors who kindly consented to contribute, the editor sent an estimate of the length of the article desired along with a request that the contents be practical and consist of the opinions of the author himself and not a statement of what 'he thought other people would think that he ought to think.' The authors were further invited to use illustrations wherever they deemed such necessary to illustrate their text, but not for merely decorative purposes.

"In the following pages one can judge how the individual authors interpreted and carried out these requests, as the editor has not presumed to interfere in the slightest degree with the material contained in the various chapters.

"For the plan of the work the editor is responsible; for its execution the responsibility lies with the surgeons of America, Britain, and far-off Australia, who so kindly consented to help him."

This first volume contains 23 chapters and an index. It is a book of 550 pages, clearly printed and satisfactorily illustrated. Dr. Binnie himself contributes six chapters, or sections. Among the other writers are the Drs. Mayo, Bloodgood, Chevalier Jackson, Samuel Robinson, McWilliams and Sir H. L. Maitland.

The book creates a distinctly favorable impression. All of the chapters are interesting and adequate; many cover subjects not suggested in their headings: for instance, "Inflammatory Affections of the Neck" includes injuries, aneurysms and tumors; and the chapter on "Larynx, Trachea and Bronchi" also treats of the esophagus and stomach.

The section on The Thyroid is particularly good; the same may be said of other sections, as The Breast, The Larynx and The Neck.

Dr. Binnie is publishing what seems at first to be a System of Regional Surgery; on closer scrutiny, however, it appears to be more accurately described as a single good-sized textbook in three volumes. The book is strongly recommended to surgeons and advanced students.

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THE WORK OF THE ARMY VETERINARY SERVICE.

IN the *Journal of the Royal United Service Institutions,* Major J. W. Rainey gives a description of the work of the army veterinary corps in France. It is a remarkable account from many points of view,—sanitary, bacteriological, economic, and military. At present this is one of the matters that the British and French manage better than we do. The horses of the British army are better than ours in condition—better for transport, battle, and ambulance purposes, and their cavalrymen and transport riders are taught to be most careful of their charges. The importance of these details cannot be overestimated. The result of scant attention to veterinary work is a loss of animal life, which means a shortage of horses, and which must be severely felt in military operations for the duration of the war.

The horses do the same work as the men: they are subject to the same accidents and diseases, and if they are not recklessly wasted and left to die when sick it is because of the existence of the veterinary corps. The veterinary corps is one of the youngest branches of the army organization, but it has more than justified its existence. Major Rainey gives some interesting statistics which show that, to put the matter on its most practical basis, the veterinary service has paid for itself by the number of horses whose lives it has saved. The horse mortality, which in the South African War reached the high figure of 55%—partly because sick horses had to be shot lest they should be found abandoned, but chiefly because there was no veterinary corps—has been reduced to 13% for the year ending December 31, 1916. It was 14.80% in 1912, and there is much hope that, when there is a larger veterinary personnel, it will be reduced still further. The value of this work will be realized when it is understood that the total animal strength of the British army in France is many hundreds of thousands of horses and mules.

Trench fighting has certainly stopped or modified cavalry work, and so reduced the mortality of horses in action; but continuous wet, and transport work in flooded country along roads broken up by heavy motor traffic, have been responsible for a large amount of horse pneumonia and influenza. Most of these animals would certainly have died had it not been for the veterinary corps; as it is they are taken to veterinary hospitals and convalescent horse depots, of which there are thirty at the front and more are preparing. Each hospital is organized to deal with the treatment of 1250 horses and mules, and with the discipline, training, and general welfare of over 400 noncommissioned officers and men. The work is not only remedial but preventive, since it is necessary not only to relieve the field units of all sick animals, but to keep a sharp eye on the outbreak of epidemic disease, which, if unchecked, might seriously paralyze the activities of the troops. Up to the present it has been found necessary to take the temperature of each animal daily, and to practise tests with mallein. Anyone who has made mallein or other tests, for glanders, will fully agree with Major Rainey that the work is of the most arduous kind, requiring trained bacteriologists and skilled veterinary surgeons. Mallein is produced at the Pasteur Institute in Paris, and the injection is made into the eyelid with a very fine needle. If the animal is glandered a swelling of the eyelid occurs, accompanied by a more or less profuse discharge from the eye. There is no reaction in healthy animals. In diagnosis, several preliminary difficulties must first be disposed of. At the last resort the distinction between animals and man, between human and equine pathology, fades away. But in practice there is a clear and simple distinction. A horse cannot report himself sick; he must therefore be inspected once daily by someone who is competent to detect incipient symptoms of disease. The thermometer is invaluable as a guide, but, as a general rule, it is not easy to discover the first symptoms of diseases like equine influenza and pneumonia. Another difficulty is the treatment of parasitic skin diseases. These appear to be especially common, since horses, like men, suffer grievously from lice. The veterinary hospitals are equipped with huge baths or tanks, containing antiparasitic solutions, into which the horses are plunged. Prevention being better than cure, it is customary to bathe and groom the animals as a routine, prophylactic measure. It seems difficult to suggest any mode of medical practice so laborious, and it is only just to dwell upon the gallantry and devotion of our veterinary colleagues. A word is also opportune in regard to the general scientific aspects of their work. There has been a progressive increase in the precision and success with which prophylactic measures have been employed, so that almost from day to day veterinary physicians and surgeons have learned to predict more surely the effect of their treatment. Thus, anthrax, a disease that once was very common, is now rather rare, and the prevention of rat-bite fever, infectious jaundice, and malaria is much better understood. The result, as the *British Medical Journal* has just observed, is a triumph of what may be called "team work" on the part of the different branches of the medical profession. Thanks to this coördination, the discovery in Japan that Weil's disease, which was formerly ascribed to infection by bacillus proteus fluorescens, is really due to a spirochete, has been confirmed by British officers on the Western front. It is needful to emphasize these matters, for there is some danger that in this country the excellent veterinary material will be overlooked. In fact, there is even now a lack of horses and mules, which means a lack of men. In the British army the veterinary corps is enthusiastic and highly efficient. To every division and cavalry brigade is attached a veterinary section, with an officer and 23 A.V.C. men, but there is the difficulty to find the necessary personnel.

ANAPHYLAXIS IN SYMPATHETIC OPHTHALMIA.

The special danger of operation or injuries to the eye, other than the intrinsic results of such injury or operation, has long been understood under the term "sympathetic ophthalmia." But the reason why injury or operation on one eye should have a deleterious effect upon the healthy eye was not understood. The reasons were broadly intimated in the light of the studies in anaphylaxis, and corroborated by recent special investigations into the causes of this special tendency to sympathetic ocular inflammation. Heretofore the ophthalmic surgeon hesitated about performing operations upon the eye or made prognoses even after mild injuries very guardedly. The surgeon understood and still understands that in the event of inflammation occurring sympathetically in the healthy eye, only removal of the offending eye can give certainty of saving the previously healthy one.

Before modern experimentation a number of hypotheses were advanced in explanation of this condition. The mycotic theory held that the sympathetic inflammation was metastatic. This becomes plausible in bacterial inflammations of the offending eye, but it can hardly explain the non-infectious ophthalmias. In the cytotoxic theory it was held that the disintegrating cells in the offending eye produced an autocytotoxin, which were specific for uveal cells of the other eye; and when carried thereto by the blood stream set up the uveitis associated with the sympathetic inflammation. But when serum was prepared according to this notion there was set up a very severe iridocyclitis when injected into animals under experimentation. The modern theory of anaphylaxis in connection with the sympathetic uveitis rather explains the reason for this severe iridocyclitis. Under the anaphylactic theory the disintegrating uvea of the injured eye becomes reabsorbed as antigen, whereupon it causes a hypersensitization of homologous tissue, which is here the uvea of the innocent eye. If this absorption is continued beyond the point of tolerance in sensitization, this sensitization passes on to an intoxication manifested clinically by inflammation of the homologous uveal tissue. The period of latency elapsing between the injury or operation of the offending eye and the sympathetic inflammation in the innocent eye is the period required for sensitization, and lasts from two to six weeks. It is the further absorption of disintegrating cells which breaks the point of tolerance and causes the trouble.

Although the antigen obtained from this source can sensitize the entire system, only homologous tissue takes part in this anaphylactic reaction, the uvea or some constituent part of it acting as the foreign protein. This sensitization is most marked in animals of the same species but this specific anaphylactic or specific chemical reaction may occur when foreign species are used in the experimentation. It is the uvea, then, that acts as a foreign protein and which has this peculiar organ specificity. The absorption of homologous uvea may cause an unmanifested sensitization until there is an insistent profusion, when distinct ocular reactions follow. But the uvea is composed of many tissues, smooth muscle, connective tissue, blood vessels and pigment epithelium, and only one of them, the pigment epithelium, is peculiar to uveal tissue. The injury of uveal tissue liberates this pigment epithelium, the absorption of the pigment being responsible for the formation of this particular antibody. It is the pigment of the pigment epithelium which acts as the antigen on reabsorption and causes both the sensitization and the intoxication inflammation. Unfortunately, much of this work was perforce carried on in animals, and it is hoped that application in man will soon evolve a remedy for this condition.

MEDICAL RELIEF FOR HALIFAX.

On the evening of the day of the Halifax disaster, the American Red Cross chapter sent a unit of thirty physicians and seventy nurses with supplies to the stricken city. The unit was under the command of Major S. H. Wolcott of the State Guard, assisted by Llewellyn Howland, Elton Clark, George H. Watson, railway expert, and Albert J. Flint of the Imperial British Relief Fund. The medical staff was under the direction of Dr. W. E. Ladd of the Boston City Hospital, and Miss Edith Cox of the Faulkner Hospital supervised the nurses. The train carrying the unit was made up of four sleepers with a dining car and six baggage cars carrying equipment for a five-hundred-bed hospital.

The hospital equipment was that prepared for Base Hospital Unit 5, the Peter Bent Brigham Hospital Unit, now in France, which took charge of a hospital at the front, already equipped. For this reason the equipment originally prepared for it had been stored at 274 Summer Street. All the bedding, including sheets and blankets, drugs, medicines, surgical instruments, rubber goods, enamel ware, surgical dressings and the like were taken along. A large amount of emergency supplies was furnished from the Red Cross Bureau of Supplies at 1000 Washington Street. Forty-two cases were sent containing 1194 hospital bed shirts, 100 flannel pajamas, 1466 bath robes, 1168 woolen and knitted sweaters, 1116 woolen mufflers, 1020 pairs of knitted socks, 500 woolen wristers, 1000 comforters, more than 1000 knitted helmets, 2100 gauze bandages, 1500 gauze compresses, 380 absorbent pads and 3871 gauze sponges. The train carried thirty-one cases of sterilized surgical dressings from the Peter Bent Brigham Hospital.

Major Harold G. Giddings of the State Guard headed the delegation of physicians. Others were Captain Robert D. Long, Major Edward A. Supple, Major Donald V. Baker, Major George W. Morse, Major Peter Owen Shea, Captain E. Fred Murphy, Captain Thomas F. Harrington, Dr. Nathaniel Morse, Captain Dewitt Wilcox, Captain John W. Dewis.

No. 2 Unit, which followed, included Dr. Freeman Allen, Dr. Franklin Balch, Dr. Arthur N. Broughton, Dr. John W. Cunningham, Jr., Dr. Robert L. DeNormandie, Dr. Kenneth L. Dole, Dr. T. J. Eastman, Dr. James M. Gallison, Dr. W. P. Graves, Dr. W. W. Howell, Dr. Foster S. Kellogg, Dr. John Mason Little, Dr. A. W. Reggio, Dr. W. A. Rolfe, Dr. Malcolm Seymour, Dr. R. H. Stephens, Dr. J. B. Swift, Jr., Dr. Richard Wadsworth, Dr. Hugh Williams, Dr. F. W. Adams, Dr. Gerald Blake and Dr. J. W. Sever.

This unit occupies the buildings of St. Mary's College and maintains a hospital of 400 beds.

The Providence chapter of American Red Cross sent a unit consisting of thirty-seven physicians and fifty nurses, increased to a total of one hundred persons by reinforcements from New Bedford, Woonsocket and Fall River. From Augusta, Maine, ten physicians of the Medical Reserve Corps and a shipment of supplies left for Halifax. The Red Cross train which left New York had on board articles valued at more than $200,000. Several special trains were made up to transport a special salvage corps of 600 men under twenty engineers, who will restore whatever houses can be saved and direct the construction of temporary shelters as rapidly as possible.

Mr. John F. Moors has been made head of the Red Cross delegation, because of his wide experience gained while directing reconstruction forces in San Francisco after the earthquake, and at Chelsea and Salem after they were visited by fire calamity. In reporting conditions at Halifax soon after his arrival, Mr. Moors stated:

> "From information so far received, I estimate that nearly 2000 were killed and perhaps 3000 severely wounded. Having been at San Francisco, Chelsea and Salem immediately after those disasters, I am impressed by the fact that this is much the saddest I have ever seen. After the others the military took immediate charge of the relief work. In this instance responsibility fell immediately upon civilians. The burden thus was exceptionally heavy.
>
> "Another group of 25 doctors and 70 nurses took possession of St. Mary's College this morning and with vigorous assistance of United States jackies, are making what was a shattered building, with snowdrifts on the floor, like the beginning of a splendid hospital.
>
> "The American doctors and nurses have taken such buildings as were available, and are converting them into model hospitals with skill and energy amazing to everybody here.
>
> "Altogether within the past 24 hours more than 200 American doctors and nurses have found immediate employment. There are here now at least 300 of the very best physicians, social workers and trained nurses of the United States, each finding his place with true resourcefulness.
>
> "Another group of 50 doctors and 50 nurses has begun a systematic house-to-house canvass of those parts of the city where wounded are still lodged in great numbers without medical care."

MEDICAL NOTES.

An Advance in State Hospital Work.—In compliance with a resolution recently adopted by the Morris County Medical Society that "if possible, at least three hospitals in the county establish a clinic for the treatment of syphilis or specific blood disorders," the Board of Managers of The New Jersey State Hospital at Morris Plains at its recent annual meeting authorized the establishment of such a clinic at this hospital. Through the liberality of high-grade drug concerns, the necessary drugs are to be provided without expense to the hospital or State. Prior to this there has been no way by which those unable to pay could receive such necessary treatment; an innovation of a public, charitable character.

Nationalization of British Medical Profession.—A bill is to be brought forward by Dr. Christopher Addison, minister of reconstruction, in Parliament, aimed to accomplish the nationalization of the medical profession in Britain. Premier Lloyd George is reported as advocating it, stating his belief that the time is ripe for a change, holding that nobody should be prevented or deterred from obtaining the best medical attendance on score of cost or charity.

Deaf-Mutism in Italy.—A report of deaf-mutism in Italy states that in 1911 there were 27,608 persons so afflicted, and 28,357 persons who were blind. For deaf-mutes, Lombardy headed the list with 5363, and Piedmont came next with 3496. The largest number of blind persons was in Sicily, where the number was 3462.

The Clinical Association of American Peroral Endoscopists.—On Nov. 1, the Clinical Association of American Peroral Endoscopists was organized in Philadelphia.

The purpose of this new society is, in the words of its constitution: "The study of diseases and accidents occurring in the respiratory and upper digestive tracts, or borderline conditions and their treatment, medical and surgical, by direct inspection."

This Association also aims to impress on the internist and general practitioner the value of bronchoscopy and esophagoscopy as diagnostic methods of precision, so as to make possible the accurate ocular study, in the living subject, of pathological conditions of the esophagus and lungs.

The officers of the Association are: president, Chevalier Jackson, Philadelphia; vice-president, Hubert Arrowsmith, Brooklyn; secretary-treasurer, Henry L. Lynah, New York; members of the executive committee, Wolff Freudenthal, New York, and Samuel Iglauer, Cincinnati.

WAR NOTES.

Deaths among American Troops in France.—For the days of December third to tenth, inclusive, General Pershing reported as follows of deaths among American troops in France. Pneumonia, both lobar and broncho- and complicated in some cases by measles, accounted for seventeen deaths, meningitis caused three deaths, and affections of the heart, three, one from scarlet fever and one from typhoid. Two were killed in action and one died as the result of wounds.

Decoration of American Sanitary Section.—The American Sanitary Section No. 5, in foreign service, has been awarded the "Fourragere," a French military decoration worn on the left shoulder. This section has already received two official citations. The communication accompanying the decoration stated that, "This glorious distinction is a merited reward for the brave men composing the section, who on a famous battlefield have given evidence of the fraternity and solidarity between the soldiers of France and America, united in the common cause."

Health in Army Camps.—The following report is issued of health conditions in army camps:

Although health conditions generally in the National Army and National Guard camps showed improvement during the week ending November 30, the number of deaths materially increased.

The report of the division of field sanitation, made public yesterday, shows that there were 164 deaths among the Guardsmen, as compared with 97 the previous week and 79 among the draft men as against 60 the preceding week. One hundred and thirty-four of the Guardsmen and 39 of the draft men died from pneumonia, and nine of the former and fifteen of the latter died from meningitis.

Only two divisions, the 34th (Guard) and the 87th (National Army) reported an increase in cases of measles and the number was small. In the divisions where there has been an epidemic of measles the disease apparently has been brought under control.

Reports from all divisions in which pneumonia has been prevalent show a decrease in the number of new cases except the 36th (Guard). Decided improvement is noted in the 30th and 31st (Guard) divisions, where extensive outbreaks of the disease have occurred. Conditions also have improved in the 30th (Guard) and 89th (National Army) divisions.

In the 36th (Guard) division the measles outbreak, which reached its height last week, has been followed up by an epidemic of pneumonia. The death rate in this division, however, has been much lower than in any other division in which pneumonia has been prevalent.

Because of the prevalence of these epidemics radical changes may be made in plans for officers' training camps to be opened a month hence. Instead of opening new camps at cantonments where measles and pneumonia are rampant, plans may be made to establish one large training camp for all Southern men at Leon Springs.

Need of Army Nurses.—A call is issued for four hundred and seventy-five graduate nurses for immediate and urgent Army service, and in the course of the next year at least 20,000 more nurses will be required. Miss Dora E. Thompson, superintendent of the Army Nurse Corps, stated that of the total number of graduate nurses in this country, approximately 80,000, only 3500 have so far been assigned to duty in the army service, and of this number 1500 are in France. The Red Cross, which is the reserve of the Army Nurse Corps, enrolled some 13,000 nurses, and hundreds of these women are now in the service, but for various reasons a great majority of the 13,000 have not reported as available for immediate duty. Any nurse who is qualified for service should not hesitate to make her application today. Her services are, or presently will be, needed by the army.

The Army Nurse Corps will supply personnel to about 100 base hospitals in this country, to many base hospitals abroad, each with 100 nurses, and to hospital trains, hospital ships and the evacuation hospitals.

War Relief Funds.—On Dec. 15 the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$304,143.06
Armenian-Syrian Fund	267,173.72
French Orphanage Fund	134,220.09
Polish Fund	93,523.73
Italian Fund	80,052.76
War Dogs' Fund	2,168.28

BOSTON AND MASSACHUSETTS.

Warning against Smallpox.—The Health Department of Boston has recently sent out the following letter relative to the possibilities of smallpox infection:

"Cases of smallpox have been discovered in Boston during the past week that have been walking about and riding in the Elevated trains and street cars, thereby exposing the community to infection.

The Health Commissioner earnestly recommends and strongly advises everyone, both adult and child, who has not been successfully vaccinated within seven years, to be vaccinated at once. This is your bounden duty, not only for your own personal protection, but for the public welfare. Let no one, or no argument, keep you from doing your duty *now*.

Smallpox is so readily controlled by vaccination, that it is almost criminal for a person not to take advantage of such a protective measure. The slight inconvenience arising from vaccination is as nothing when compared to the ravages of the disease itself. If a person happens to be immune, there is no inconvenience at all.

There is no physical condition which contraindicates vaccination, and if there is an extensive outbreak of the disease in this city, it will be the fault of the citizens themselves in refusing to take advantage of precautionary measures.

Week' Death Rate in Boston.—During the week ending Dec. 15, 1917, the number of deaths reported was 229, against 201 last year, with a rate of 15.48, against 13.78 last year. There were 33 deaths under one year of age, against 32 last year.

The number of cases of principal reportable diseases were: diphtheria, 124; scarlet fever, 34; measles, 81; whooping cough, 44; typhoid fever, 2; tuberculosis, 44.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 2; measles, 1; tuberculosis, 2.

Total deaths from these diseases were: diphtheria, 4; measles, 8; whooping cough, 2; tuberculosis, 20.

Included in the above were the following non-residents: measles, 1; tuberculosis, 2.

New Department of City Hospital.—The new West Department of the City Hospital, to be used for communicable diseases in children, was opened for the reception of patients on December 14. Mr. Shuman, president of the board of trustees, in writing to the Mayor regarding the use of this hospital stated as follows:

"Communicable diseases are prevailing in Boston to such an extent as to give the trustees of the Hospital Department considerable anxiety. The South Department can decently care for but 345 patients. There are today 320 patients there. You are aware of the fact that in recent years we have been compelled to open up the Southampton wards, which are not at all adapted for the care of contagious diseases.

"Through your foresight, the present West Department was transferred to the City for the extension of the South Department and the building formerly occupied by the Parental School has now been remodeled for such purpose. To provide for even a slight increase, the trustees deem it imperative immediately to open two buildings at the West Department, one for the care of diphtheria and the other for the care of whooping cough. This is an emergency which must be met immediately."

Springfield Academy of Medicine.—The December meeting of the Springfield Academy of Medicine was held in Commercial High School Hall on Tuesday, December 11, 1917. The program consisted of moving pictures of clinical and war surgery.

The teaching courses will be held on Fridays from 4 to 6 p.m., beginning January 4, 1918. There are two courses as follows:

SURGERY.

Jan. 4. Dr. J. B. Blake. Recent Advances in Surgery.

Jan. 11. Dr. C. F. Painter. Surgical Lesions of Bone.

Jan. 18. Dr. W. H. Porter. The Surgeon at War.

Jan. 25. Dr. J. B. Blake. Surgical Diseases of the Abdomen.

Feb. 1. Dr. J. H. Cunningham, Jr. Genito-Urinary Diseases.

Feb. 8. Dr. E. P. Richardson. Minor and Traumatic Surgery.

MEDICINE.

Feb. 15. Dr. W. H. Smith. Circulatory Diseases.

Feb. 22. Dr. E. H. Place. Infectious Diseases.

March 1. Dr. J. B. Hawes, 2nd. Syphilis and Tuberculosis

March 8. Dr. H. F. Hewes. Diseases of the Gastro-Intestinal Tract.

March 15. Dr. E. P. Joslin. Diseases of Metabolism.

March 22. Dr. H. W. Bowditch. Modern Diagnostic Routine.

Courses are open to members of the Academy upon payment to the Treasurer of registration fee of $5.00 for each course.

Registration in each course is limited to 25 members. L. D. Chapin, M.D., *Secretary.*

The Massachusetts Medical Society.

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NOTES FROM THE DISTRICT SOCIETIES.

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Berkshire, A. P. MERRILL, M.D., Pittsfield.
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.
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Essex South, H. P. BENNETT, M.D., Lynn.
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Hampshire, E. E. THOMAS, M.D., Northampton.
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WORCESTER DISTRICT MEDICAL SOCIETY.—Revised list of physicians in military service of the United States or the Allies:

U. S. ARMY.

Medical Officers' Reserve Corps.

(*a*) On Active Duty.

Dr. Howard Beal, Worcester
Dr. Edw. B. Bigelow, Worcester
Dr. Frank W. George, Worcester
Dr. Roger Kinnicutt, Worcester
Dr. E. B. Simmons, Worcester
Dr. William E. Denning, Worcester
Dr. Willard Lemaire, Worcester
Dr. James J. Goodwin, Clinton
Dr. Chester C. Beckley, Lancaster
Dr. Roger Schofield, Worcester
Dr. Merrick Lincoln, Worcester
Dr. George C. Lincoln, Worcester
Dr. E. F. Phelan, North Brookfield
Dr. R. S. Newton, Westboro
Dr. William J. Fay, Worcester
Dr. A. K. Yoosuf, Worcester
*Dr. James V. May, Worcester
Dr. Samuel C. Gwynne, Worcester
Dr. Harry P. Cahill, Worcester
Dr. Israel Lurier, Worcester
Dr. Donald Gilfillan, Worcester
Dr. D. F. O'Connor, Worcester
Dr. Homer Gage, Worcester
Dr. D. A. Thom, Worcester

(*b*) Commissioned, but not yet called to Active Duty

Dr. George F. Little, Uxbridge
Dr. Willard P. Stapleton, Worcester
Dr. Frank T. Oberg, Worcester
Dr. H. L. Simmons, Worcester
Dr. Charles Salmon, Worcester
Dr. David Bridgewood, Worcester

Staff Officer 104th Infantry.

Dr. Joseph O'Connor, Worcester

U. S. NAVY.

Dr. Gilbert Haigh, Worcester
Dr. Linwood Johnson, Worcester
Dr. Thomas Courtney, Worcester
Dr. Joseph L. Lannois, Northboro
Dr. Winthrop Adams, Worcester

U. S. SELECTED SERVICE.

(*a*) Local Boards.

Dr. James C. Austin, Spencer
Dr. Edw. W. Balmer, Whitinsville
Dr. J. Arthur Barnes, Worcester
Dr. Frederick Bryant, Worcester
Dr. John F. Harkins, Worcester
Dr. Ernest L. Hunt, Worcester
Dr. William W. McKibben, Worcester
Dr. A. J. McCrea, Southbridge
Dr. George L. Tobey, Clinton

(*b*) Medical Advisory Board.

MASSACHUSETTS HOME GUARD.

Dr. L. F. Woodward, Worcester
Dr. C. A. Sparrow, Worcester
Dr. Roy J. Ward, Worcester
Dr. Frank L. Magune, Worcester
Dr. George F. H. Bowers, Worcester
Dr. Peter O. Shea, Worcester

ENGLISH ARMY (Harvard Unit).

Dr. Kendall Emerson, Worcester
Dr. Oliver Stansfield, Worcester
Dr. Stanley Bridges, Worcester
†Dr. George Watt, Worcester

ENGLISH HOSPITALS.

Dr. Albert O. Raymond, Worcester
Dr. William H. MacKay, Worcester

AMERICAN AMBULANCE (Paris).

Dr. W. Irving Clark, Worcester

The Medical War Committee invites information to supplement or correct this list. Doctors joining the Colors should notify the committee and indicate their wishes with regard to sharing the fees derived from their patients.

ERNEST L. HUNT, *Secretary.*

Obituary.

EDWARD A. AYRES, M.D.

DR. EDWARD A. AYRES of Branchville, N. J., a well-known physician of New York and writer on medical subjects, recently died after a four days' illness of pleuro-pneumonia. Early in his career Dr. Ayres was prominent in New York literary and medical circles. He was professor of obstetrics in the New York Polyclinic Medical School for twenty years and was founder and president of the Mothers' and Babies' Hospital of that city. He won the Carpenter prize at the New York Academy of Medicine with his essay on "The Mosquito as a Sanitary Problem." This appeared in M. G. Fulton's "Expository Writing" as one of the fifteen best examples of the English language. He was also the author of "Physical Diagnosis in Obstetrics." He invented various medical instruments and also a hospital operating bed now used in New York infirmaries. Dr. Ayres was a member of the Felborn Academy of Medicine, an honor man of the Brooklyn Medical Society and a member of the Salmagundi Club.

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* Honorably discharged.

† Enlistment expired.

ORRAN GEORGE CILLEY, M.D.

Dr. Orran George Cilley died at his home in Boston, December 9, 1917, following a short illness. He formerly was prominent here as a coroner, before the days of medical examiners.

Dr. Cilley was born in Pittsfield, N. H., on April 4, 1840, the son of Jonathan E. and Elizabeth Cilley. He received a common school education in the town of Canterbury, where he resided during his youth, and afterward attended the seminary at Northfield, N. H. He was a student for two years at the Harvard Medical School and graduated at Dartmouth Medical School in 1868. He then studied medicine with Dr. Sawyer of Biddeford, Me., for a period of two years. He came to Boston in 1869, and settled at 35 Cambridge Street, where he had been in active practice ever since. He moved his home to Charles street about two years ago.

Dr. Cilley was appointed coroner by Governor Washburn and held that position for five years, until the present law creating medical examiners went into effect, in 1877. In February, 1873, he was appointed surgeon of the First Battalion of Cavalry, M.V.M., and held the position for six years. He was physician for many years at Charles Street Jail, until about two years ago. He was a thirty-second degree Mason. In 1884 he received from Dartmouth his A.M. degree. The previous year, 1883, he was appointed Surgeon-General of Massachusetts. Dr. Cilley, who was a widower, is survived by a daughter, Miss Dorothy Cilley, who lives at the family home in Charles Street.

Miscellany.

FARM COLONIES FOR TUBERCULOUS SOLDIERS.

It is stated in the *British Medical Journal* that during the past year the National Association for the Prevention of Consumption has urged the formation of farm or garden colonies, where discharged tuberculous soldiers, while regaining their health, may be trained in open-air occupations. At the annual meeting of the Association on July 16, Professor Sims Woodhead sketched his own idea of a model farm colony. It should consist of a large enough tract of land to allow variety in the forms of cultivation introduced. The aim was not only to provide the patient with suitable and congenial work, but also to give him an occupation which should serve him as a means of livelihood and a part of the farm colony, therefore, should be laid out on a generous allotment system. The colony should serve as an educational center and show how much could be done to improve the conditions of farm workers and the hygiene of farm buildings. To that end every farm colony should be a microcosm in which the maintenance of health and the prevention of infection should be absolutely secured. He thought also that accommodation should be provided for advanced cases. As far as possible, the patients should do the whole work of the colony themselves, and even the overseers should be tuberculous patients who were coming to the end of their term. The patient should help to contribute to the cost by his own labor. The state must provide the land, and it might also contribute towards preparation of the land and erection of the general buildings. But the special buildings, particularly the hospital buildings, should be jointly provided by local taxation, treasury loan, and voluntary subscription. As the patient got stronger a certain portion of his earnings should be set aside as a bonus for him when he made a new start in life. In the subsequent discussion Sir R. W. Philip suggested that there was some risk of opening the door of the farm colony too wide. If the colony was to be a dumping ground for all grades of tuberculosis, its purpose would be defeated. There must be a clear separation between early and presumably curable cases and dying cases; for the latter, of course, humane provision must be made, but not that of a farm colony. The class of cases to be taken were those which lasted a much longer time than the sanatorium could afford to keep them. Sir William Osler said that the essence of success in the treatment of the consumptive soldier was that he must remain a soldier—that is, he must be under control. Discipline was a very necessary factor in the life of a farm colony. Sir A. Griffith-Boscawen, M.P., parliamentary secretary to the Ministry of Pensions, said that his department had been faced with the difficulty that medical boards had generally assumed that when a man was discharged for tuberculosis the condition was not attributable to military service, and the result was that until lately the man had been turned adrift without pension or other provision. In France in such cases the benefit of the doubt was given to the man. The conditions of the service might at least have brought out the disease earlier than it would otherwise have manifested itself. The policy now was to assume in all cases that the disease was the result of military service unless the contrary was clearly proved.

Correspondence.

CONTAGION IN SCARLET FEVER.

West Newton, Mass., Dec. 10, 1917.

Mr. Editor:--

May I be permitted to differ from the conclusion drawn by the otherwise excellent editorial on the "Duration of Contagion in Scarlet Fever" in the Journal of Nov. 29th?

I think that no well-informed health officer believes today that infection in scarlet fever is transmitted by the scales of desquamation, and the phrase "As long as there is desquamation there is infective discharge from mucous membranes" is misleading, because it does not go far enough.

The infective discharge from the nasal mucous membrane may continue long after desquamation has ceased.

It is, of course, impossible to determine beforehand the actual necessary period of isolation in any given case, and for that reason a minimum period should be laid down which can be lengthened if necessary.

The report of the Committee on Control of Communicable Diseases of the American Public Health Association, the Chairman of which is Dr. Haven Emerson of New York, states that the period of communicability in scarlet fever is "four weeks from the onset of the disease, and until all abnormal discharges have ceased and all open sores have healed." This, of course, includes discharges from suppurating glands and ears.

The present tendency among health officers is to make the period of isolation as short as is compatible with safety and to lengthen it when necessary in any individual case, rather than to impose a maximum period for all cases; in other words, to make it as short as possible instead of as long as possible.

Francis Geo. Curtis, M.D.,
Chairman, Newton Board of Health.

RELIEF OF BELGIAN AND FRENCH PHYSICIANS.

Baltimore, Dec. 8, 1917.

Mr. Editor:—

In order to further the subscriptions to the fund now being collected by Dr. W. W. Keen of Philadelphia for transmission to our Belgian and French colleagues to help them in re-establishing themselves in their homes and offices, I should be very glad if you could find space to print the enclosed letter which I have received from Dr. Triboulet of Paris. Dr. Triboulet is a distinguished physician of the Hôpital Trousseau, and was in this country at the time of the International Congress on Tuberculosis in 1908. All that he says can be relied upon perfectly.

Believe me,

Very sincerely yours,
Henry Barton Jacobs.

25 Avenue d'Antin, Paris, VIIIe.

Dear Dr. Barton Jacobs:—

After three years of the most frightful cataclysm, France is always up. She has saved herself and the civilized world: at what cost you may think of it by the narrations you may read: they are nothing compared with the reality. Some of the oldest and richest provinces (in soil, industry, and art) are now a desert. Today, tomorrow, and the days after tomorrow we must use all our energy and money in building again and in helping those who are in awful distress. Among the latter are the medical faculties, and I hesitate no more to send you and the U. S. confrères the most earnest appeal. If indiscretion is not too great, will you allow me to ask you to be an intermediary for this international medical problem: to give our spoiled confrères the necessary means to come back and live in their devastated homes? The French Medical Associations will collect nearly a Million Francs by corporations, private funds. In our Northern invaded departments (Oise, Somme, Pas de Calais, Aisne, Nord, Marne, Ardennes, Meuse et Meurthe et Moselle), there are 2000 doctors. From these 2000 confrères, *1000*, at least, will want material help to begin again their professional life, and we think five thousand francs—5000 Fs., the necessary sum of money for each one. The million we possess is every day lessened by the necessity of immediate help to the expelled medical families, when repatriated day after day, or week after week.

Enclosed you may find printed matter showing some instances of what we do and of what is to be done. I am sending the same appeal to Dr. Pearce Bailey, one of my friends in New York. Perhaps you could give me some new addresses anywhere?

I hesitated a long while before writing this. U. S. A. did do, and will do so much for France, that one is quite ashamed to ask again! But proudness is unreasonable in such questions, and I make myself very humble for the sake of the confraternal misfortunes. A sort of incitement came a few days ago when the Uruguay confrères sent us spontaneously 35,000 francs in a cheque.

Please, dear Dr. Barton Jacobs, excuse this long and tedious affairs letter. You know the reasons that inspired me. Please agree my most respectful regards for Madame Barton Jacobs, my best remembrances and wishes for the beloved Johns Hopkins Medical and Surgical Staff, and believe me,

Yours very heartily,
28/5/17. Henri Triboulet.

My family gave three "poilus" to dear France; one—aviator, one artillery officer; both wounded and cured, and started again; the third in Engineers Corps, a young 18½ fellow.

Magnin's son is a brave little one; he is in the Salonica Army in the medical staff. French, and I am sure U. S., youth is full with ardor and confidence. "On les aura" is the common expression. Don't judge our people in books or in newspapers; one must see him at work; that is splendid. In a near future, you will come and see that, and you will find here an old man, very, very happy to see you at the well deserved peace-hour.

Long live the sister republics!

RECENT DEATH.

Honoré Joseph Coté, M.D., a Fellow of the Massachusetts Medical Society, died in Boston, of cerebral hemorrhage, Nov. 7, 1917, aged 56 years. He was a graduate of Tufts College Medical School in the Class of 1899, and was a member of the American Medical Association.

MARRIAGE.

The marriage is announced of Miss Helena M. Howard, graduate nurse of Carney Hospital, and Dr. Alfred J. Leary, of the x-ray department of that Hospital.

APPOINTMENT

Dr. R. E. Stone has been appointed to the staff of the Benjamin Stickney Cable Memorial Hospital at Ipswich, as Visiting Anesthetist

The Boston Medical and Surgical Journal

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Original Articles.

REPORT OF TREATMENT OF CARCINOMA OF CERVIX AT THE HUNTINGTON HOSPITAL FOR PERIOD OF FOUR YEARS.

BY EDWARD H. RISLEY, M.D., BOSTON,
Surgeon to Collis P. Huntington Hospital

AND

GEORGE A. LELAND, JR., M.D., BOSTON,
Surgeon to Out-Patients, Collis P. Huntington Hospital.

THIS paper is a report of the results obtained in the treatment by radium of a series of 113 cases of carcinoma of the uterus at the Huntington Hospital from January, 1912, to June, 1916, inclusive.

In order to form a proper estimate of the value of treatment it is necessary to divide the cases into several definite groups; otherwise, statements in regard to results in cancer of the uterus are of little value unless we consider the groups separately.

Group I.—Cases of border-line operability in which pre-operative radium treatment aims at a reduction in the size and fixation of the mass, rendering the chance of total extirpation more promising.

Group II.—Cases accepted for prophylactic radiation following radical hysterectomy.

Group III.—Those of recurrence following hysterectomy.

Group IV.—Those of recurrence or continuation following curettage or cauterization.

Group V.—Those which were primarily and unquestionably inoperable. There have been no cases accepted for radium treatment alone where radical hysterectomy seemed possible.

Case histories have been examined especially with the idea of forming some estimate of what the first symptoms were that brought the patient to her physician, of what type the local physical signs and findings were, of forming as nearly as possible a probable prognosis, of getting an idea as to what the general effects of radium treatment were, and of determining in what percentage of cases a positive pathological report was made.

In the early months of the hospital five cases were treated by injections of ascitic fluid. Twenty-three cases were examined, but for some good reason were not treated and are not included in the study of this series. Ninety cases were taken as a basis of study. All of these received radium treatment.

It has been very gratifying to find that a large number of our cases are referred from other hospitals, both for consultation and for treatment. It was found that fifty-six cases were referred from other institutions, and thirty-four from physicians elsewhere. The oldest case treated was 68, the youngest 30, and the average about 50 years.

First symptoms were reported as flowing in 84 cases, pain in 5, and amenorrhea in 1. Local physical signs were recorded as follows: ulceration only, 3 cases; sinus, 5 cases; implantation on vaginal wall, 21 cases; implantation on abdominal wall or in abdomen, 3 cases; glandular metastases (at time of admission), 5 cases; cervix nodular (plus other signs), 19 cases; mass in vault, 24 cases; ulcerated or necrotic mass, 35 cases; crater, 25 cases; extension to vaginal walls, 28 cases; bleeding of greater or less degree, 42 cases; extension to broad ligaments, 33 cases; pelvic masses, 7 cases; involvement of bladder, 6 cases; involvement of rectum, 4 cases; fixation of uterus or broad ligaments, 13 cases. Thus it is evident, therefore, that cases of all grades of severity were accepted for treatment, and no effort was made to pick out only the probably favorable ones.

The prognosis was stated as favorable, probably favorable, or border-line in 16 cases; unfavorable in 39 cases; very unfavorable or hopeless in 22 cases; and not stated in 13 cases. Of these reported as favorable, there are today 3 alive without recurrence, 2 with a question of recurrence, 4 not doing well (disease progressing), 6 dead, and 1 lost track of. These were all originally post-operative recurrent cases. All of the cases reported as unfavorable are dead except one, as are all of the hopeless cases.

Pathological reports made, either at the Huntington Hospital, or before entrance, were recorded in 38 cases. No pathological report was made, or at least was not recorded, in 52 cases. This small number of pathological reports is accounted for partly from lack of accurate data obtainable from patients coming to us from remote regions and partly because of the policy of the hospital not to cut into suspicious tissues because of the very real danger of dissemination of the disease. Practically all of the cases, however, have been unmistakably carcinoma as far as clinical signs go. The disease was reported as carcinoma in 12 cases, adenocarcinoma in 7 cases, squamous cell in 9 cases, epithelial in 3 cases. Specimen taken but no pathological report in 7 cases.

In general the effects of the radium treatment are recorded as follows: temporary local benefit, 44 cases; much improved, 5 cases; entire relief from pain, 5 cases; some relief of pain in all but a few complaining of this symptom; complete relief from bleeding, 14 cases; healing of ulceration, 11 cases; decrease in the size of the growth, 8 cases; no improvement at all in 13 cases; increase in the growth (some rapid) in 30 cases; fistula (vesico-vaginal) developed in 2 cases; mass made more movable in 8 cases.

Mortality. There were 2 deaths from disease other than carcinoma,—1 from pneumonia and 1 from pelvic abscess. The results remain unknown in spite of a very efficient follow-up system in 7 cases. The total mortality dated Feb. 1, 1917, is 62 cases. There are 21 cases in this series still under treatment for observation.

The radium has been applied:

Per vaginam in 89 cases.

Per rectum in 1 case.

Over abdominal scar in 1 case.

Over inguinal glands in 2 cases.

The dose in this series has averaged less than 1000 millicurie hours.

Hemorrhage has been easier to control than pain because the superficial ulcerations are more readily affected than the deep extensions. The latter have been rarely improved and if so only temporarily. The healing of the vaginal disease is often accompanied by contraction of the vagina, which renders difficult satisfactory apposition of radium to the persisting deeper extensions. Long exposure with screening of the superficial radium rays has been preferable to short exposures without screening, except in rare instances of very superficial vaginal recurrent lesions.

Group I.

The number of cases treated as a preliminary to operation is very small—only 5. It is probable that pre-operative radium to the cervix and vault and over the abdomen acts in some measure like the Percy cautery in that it kills some cancer cells, and allows some softening of the mass without scattering cancer cells, checks foul discharge, and leaves a somewhat cleaner mass to be removed.

Many operators affirm that operation soon after radiation is much more difficult because of greatly increased venous bleeding, and that the operative difficulties are increased, also because of the foundation of adhesions and fibrous tissue. We believe, however, that pre-operative treatment is a line that should have the benefit of much further trial. We are also positive in our belief that none of these cases should be allowed to go without thorough post-operative radiation as well. It is never possible to tell, even in the widest surgical direction, when all cancerous cells have been removed, therefore, these cases which were of the border-line type would seem to be the type in which post-operative prophylactic radiation was the logical procedure.

There were five cases of border-line operability (as determined by more or less fixation of the broad ligaments or uterus), in which, after a certain amount of the radium treatment, the mass became more movable and which were then considered operable. Of these, three are alive today, one eighteen months after operation and without symptoms, one twelve months after operation and without recurrence, one twenty months after operation but with local recurrence. Two are dead,—one died three weeks after operation (cause not stated), and one free from disease for two years after operation, then recurrence and death after four months of radium treatment. If this method is given extensive trial there may result numbers of seemingly inoperable cases which will be given a chance at operation and a possible further escape from extension of the disease.

Group II.

The policy of the hospital in the early days of treatment was to wait for definite signs of recurrence before attempting anything in the way of prophylactic radiation. With the advent of greater familiarity with the conditions under which recurrence takes place and the examination of the great number of suspicious cases, and also with the increasing realization that it is within no man's power to determine, even in the most extensive and radical removal of glandular areas, when all cancerous cells have been removed, it has gradually become our policy to accept for prophylactic radiation after hysterectomy these cases in which, in the surgeon's opinion, the disease probably was not entirely eradicated.

In view of the reports from other workers with radium and our increasing efforts to deal with precancerous conditions, it seems rational that we should more and more frequently treat all our malignant disease post-operatively by prophylactic radiation, either with radium or x-ray. This is certainly a logical procedure, and it is our hope that the profession in general will recognize this and send cases directly after operation for a course of prophylactic radiation.

Our series shows an altogether too small number of this type of cases—five in all; of these, three are now alive and without disease fifteen months after operation and one with disease twelve months after operation. One case is not traced to date, but was free from disease for eight months after operation. One case died of recurrence fourteen months after operation.

Group III. Post-operative or Recurrent Cases.

The follow-up system in all cases, now becoming more and more effective in our hospitals, is already producing results in that we are beginning to get post-operative cases back for observation regularly and are able to treat them vigorously at the very first suspicion of any recurrence if for any reason we do not see fit to institute prophylactic treatment. The future outlook for such cases seems good. Early radical operation with early radiation of recurrence ought to produce greatly better results.

It can be pretty definitely stated that very superficial or small recurrence in the vault of the vagina, especially those which manifest themselves as superficial ulcerations, are practically always favorably affected by the radium. Dense nodular recurrences are more difficult to penetrate and more often accompanied by lymphatic involvement and hence less favorable. Recurrences after hysterectomy generally occur in the vagina, either along its walls or in the vault in the scar of operation. If taken early these cases generally respond quickly to radium.

This group comprises 37 cases recurrent after hysterectomy—16 after the Wertheim operation and 21 after hysterectomy of type not stated. Three of these have not been traced. Eight are alive today and without disease, 2 with a question of recurrence and five with definite recurrence. Twenty are dead, and the average duration of life after operation and the beginning of radium treatment was eight months.

Group IV.

This group comprises recurrent cases of all stages of recurrence; a great many of them being advanced and with large masses of malignant tissue to deal with,—a class carrying a prognosis almost equally as bad as the originally inoperable cases. These cases which return for radiation early after first suspicion of disease can definitely be given a hopeful prognosis of a considerable prolongation of life, with much relief from pain and delay in the progress of the disease. The least favorable group of cases is that in which there is recurrence or continuation of the disease following curettage or cauterization.

Practically all of these cases were received anywhere from two weeks to eight months after the palliative operation, and in almost every case there had been steady progress of the disease since the operative procedure. These cases have not done particularly well. It is believed that, on the other hand, if cases can be thoroughly cauterized, getting rid of practically all of the diseased area, a real crater formed of the cervix and radium immediately placed in the cavity, better results can be obtained. There were 21 cases. Two are not traced. One is alive and without recurrence nineteen months after beginning radium, and 3 were lost sight of. Four others are alive, but all with disease with an average of ten months after beginning radium treatment. Fifteen are dead, with an average duration of eight months after institution of treatment.

Group V.

As would be expected, every clinic shows a larger number of inoperable cases sent for radiation than any other type of case. A general statement only in regard to this type of case can be made, as follows. Probably only palliation can be hoped for. A cure is rarely to be expected in the light of our present knowledge of radium technic. There are enthusiasts who offer more hopeful opinions, but the mass of cases treated is not yet large enough to be at all convincing. However, much relief from distressing symptoms can be brought about in this unfavorable type of cases, even if extension into the broad ligaments and lymphatics destroys all chance of cure.

There are three things that radium can do in practically every case. It can check hemorrhage, stop to a large extent foul discharge (of course depending on the size of the growth), and in many cases it does control pain. We never predict to patients that we surely can do any of these things, but we can give them a reasonable assurance that such will be the case. Certainly energetic radium treatment in the inoperable case offers more in the way of relief from symptoms than the use of the red hot cautery and curettage as formerly employed, and numerous writers believe the prolongation of life is greater.

In this connection, it would seem wise in making any statement in regard to radium, as well as any other non-operative form of treatment, to be conservative and consider well all the factors entering into the improvement of the patient. The temporary improvement seen in many cases is undoubtedly due, in some instances, to the recuperation of the system dependent on checked bleeding. The temperature arising from the absorption of toxic products is lowered and a general improvement is felt by the patient, who thereby gains new courage from the psychic as well as the physical factors involved.

This group includes 22 cases comprised entirely of definitely inoperable cases; only 1 has not been traced. There are 3 alive, all with disease with an average duration since starting radium treatment of 22 months. These are interesting figures, showing the apparent retardation of growth and bettering of general conditions following radium in this type of case. Apparently the original growth is of a more slowly progressing nature under radium in these cases than recurrent growths after hysterectomy. There are 18 cases dead, all with disease with an average duration of life after the beginning of radium treatment of nine and a half months.

A summary of these grouped cases shows:

Five without disease—one, 18 months; one, 15 months; two, 12 months; one less than 6 months.

Twenty-one alive (two with question of disease less than 6 months)—seven not traced but two free from disease eight or nine months after it started; fourteen with disease.

Sixty-two are dead.

The points of interest and value brought out in this analysis are as follows: Much symptomatic relief can be expected from radium treatment, especially in the checking of hemorrhage and alleviation of pain. Prophylactic radiation immediately following hysterectomy is a logical, safe and advisable procedure and should reduce the number of recurrences. The treatment of early recurrences offers a fair prognosis. Late treatment offers little but alleviation of symptoms and but little retardation of growth. Inoperable cases are benefited by radium and the period of life is somewhat prolonged. Radium should be given more extended and earlier trial in these cases. It is believed that every case operated on should be required to report for observation once a month for the first year and once in three months for the second year and at frequent intervals for each succeeding year. Only in this way can early recurrences be detected and early institution of radium treatment be started.

NORMAL WEIGHT.

By Horace Gray and K. M. Gray, Boston.

In the course of some recent work on lipoids in diabetes, which will appear in this Journal in January, the question came up, "What is normal weight?"

Often the answer must be a guess, owing to lack of data at hand. Even in practice a guess may be inadequate, while it becomes worthless in research.

The usual age-weight tables have of late been regarded as inferior to an age-height-weight coefficient.

Wood, T. D.: The 9th Yearbook of the National Society for the Study of Education, Part I, Health and Education, Chicago, 1910, p. 34.

Medico-Actuarial Mortality Investigation, Vol. I, Statistics of Height and Weight of Insured Persons, compiled and published by the Assn. of Life Insurance Directors and the Actuarial Society of America, N. Y., 1912, pp. 38 and 67.

Superior to this again would be an *American* age-height-weight index. Such a standard I have found only in the above two sources. As the original tables were traced with considerable difficulty, their reproduction is the main object of this paper.

In defence of the varying classic age-weight tables,[1] however, and as an indication that finality will remain an academic ideal until the nations have become much more intermingled, the following points may be noted in passing:

1. Insurance experts allow 20% plus or minus as a safe variation from the supposedly healthy average normal weight.

2. Considerable variation exists between the averages of different countries, and (within the same country) of different cities.

3. In more than 74,000 observations there was "a difference of five (5) inches between the average stature of the best and worst nurtured classes of the community. . . while. . . at birth children are of the same average size in all classes."

Farr, W., *et al.*: Anthropometric Committee, Report of British Assn. Adv. Sc., 1880, p. 120.

Galton, F., *et al.*: *Ibidem*, 1881, p. 225.

This defence is fortunate since we must rely on age-weight tables for the remaining two of the four age groups usually followed:

I. Birth	American age-weight
II. 1-4 years	
III. 5-14 years	American age-height-weight
IV. 15 and over.	

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[1] Vierordt, H.: Daten und Tabellen für Mediziner, Ed. 3, Jena, 1906, collates the figures of more than 50 investigators.

It will be noticed that these groups differ from those familiarly followed for physical purposes other than weight:

A. Infancy (through the 2d year).
B. Childhood and adolescence.
C. Adult life.

Age Group I.

Table 1. Heights and Weights of Children at Birth. (Without Clothes.)

Sex	Number	Heights Inches	Weights Lbs.
Boys	231,590	20.6	7.6
Girls	211,568	20.5	7.2

Holt, L. E.: Diseases of Infancy and Childhood, Ed. 7, N. Y., 1916, p. 15.

Kerley and Morse both follow Holt for this group.

Kerley, C. G.: Practice of Pediatrics, Philadelphia, 1916, p. 41.
Morse, J. L.: Case Histories in Pediatrics, Boston, 1913, p. 12.

Age Group II.

Table 2. Heights and Weights of Children between 1–4 Years of Age (Without Clothes).

5602 Boys			4821 Girls	
Height in.	Weight lbs.	Age mos.	Height in.	Weight lbs.
26.5	18	6	25.9	16.8
27.3	19.1	7	26.5	17.4
27.6	19.8	8	27	18.3
28.1	20.4	9	27.6	19.1
28.5	20.9	10	27.9	19.5
29	21.4	11	28.4	20.1
29.4	21.9	12	28.9	20.8
29.9	22.9	13	29.4	21
30.3	23	14	29.5	21.6
30.8	23.6	15	30.1	21.9
31.1	24.1	16	30.5	22.6
31.4	24.5	17	30.8	22.9
31.8	24.6	18	31.1	23.4
32.3	25.5	19	31.5	23.8
32.6	25.8	20	32	24.1
32.9	25.8	21	32.3	24.8
33.3	26.9	22	32.6	25.3
33.6	27	23	32.9	25.6
33.8	27.1	24	33.4	26.4
34	27.9	25	33.8	26.9
34.1	28.3	26	33.9	27.3
34.8	29	27	33.9	27.3
35.1	29.1	28	34.6	27.8
35.4	29.3	29	34.8	27.8
35.4	29.5	30	34.9	28.3
35.5	30.5	31	35.1	28.8
36	30.6	32	35.4	29
36.1	30.6	33	35.6	29.1
36.5	31.1	34	36.5	30.1
36.8	31.9	35	36.5	30.3
37.1	32.3	36	36.8	30.5
37.4	32.3	37	36.8	30.8
37.7	32.4	38	37	31
37.9	33.1	39	37.3	31.6
38.5	33.5	40	37.5	32
38.6	33.6	41	37.8	32.3
38.6	33.8	42	38	32.5
38.8	33.8	43	38.3	32.8
38.9	34.3	44	38.5	33
39	34.5	45	38.5	33.3
39	34.8	46	38.8	33.3
39.3	35.8	47	38.9	33.5
39.5	35.9	48	39	33.8

Crum, F. S.: Quarterly Publication of the American Statistical Assn., Sept., 1916, N. S., No. 115, Vol. xv, Boston, pp. 332-336, and also printed by the American Med. Assn., on a card, in the "Anthropometric Table."

The following quotations from Crum are pertinent. The insert in brackets is from a personal communication by the same expert.

"About 1910 the *Woman's Home Companion* inaugurated a novel plan to direct public attention to the fact that our children are less perfect physically than is generally assumed to be the case. . . Up to 1914 the table of standards with which children under 5 years were compared was based upon too small numbers to warrant its use for anything more than approximate averages. . . During the year 1914 a new development of the central purpose of Better Babies Contests was fostered by the Committee on Public Health and Instruction of the American Medical Assn., but under the title 'Baby Health Conferences.' The measurements at both contests and conferences are made in. . . accordance with instructions which go with the score cards. . . In the early part of 1916 I found that the aggregate. . . exceeded 10,000, and this was thought to be a sufficiently large number to give. . . a revised standard anthropometric table for children of ages 6 to 48 months, both inclusive. . . This table, and the preliminary one in 1914, are thought to be the first for this country constructed in just this way—that is, from healthy children, all measured according to uniform rules and, in the main, by physicians, nurses, or other specially instructed persons. These tables differ somewhat from those referred to by pediatrists. . . (These of mine may be regarded, possibly, as somewhat supernormal, or above average. The average measurements, however, are more typical of healthy children than those obtained from children in hospitals). The great majority of the children whose measurements are included in this table were of American-born parents; the children, however, were of different stocks, including German, Irish, Swedish, some Italian, and some of various other races. It would be desirable to have similar tables for the different racial elements, and perhaps even for different sections of the country. There is some evidence that the average measurements, even of these young children, would be found to differ, in the South, for instance, as compared with the North and West, entirely aside from the probable racial differences. It would seem, however, that this table, being based upon measurements of normal healthy children in various sections of the country, should serve as a fair guide for many practical purposes without any additional refinements."

The "6 months to 60" Score Card of the Better Babies Bureau of the *Woman's Home Companion* was based[2] "upon Boas originally and was later modified to suit our own needs. We found, after holding a great many contests, that Boas' figures were low, at least for the prize babies that came into the contests; in other words, that there were too many 100% babies under these standards. The Better Babies' contests were unique in that they brought together healthy, instead of sick, babies; and it was perhaps for that reason that we failed to find the Boas standards satisfactory for our purposes. We believed that the highest possible standard should be set for babies entering these contests, even if these standards were above the measurements of the average child. We therefore set as our standard a height which was an inch to an inch and a half greater than Boas' figures, and a weight which was one to one and a half pounds greater than Boas' standard. The other measurements were correspondingly increased, except in the case of the circumference of the head, a large head often being an indication of rickets or other diseased conditions. For this reason our figures probably will not interest you, since they are not based upon accurate and scientific investigation, such as are Boas' or Burk's, Bowditch's and Porter's, and were, therefore, never published" except as the Score Card, a loose sheet easily obtainable from the magazine.

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[2] Lane, Gertrude B.: Personal communication.

Holt has a table for this period from 1 to 4 years, based on about 2000 personal observations.

Kerley and Morse each follows Holt.

The Life Extension Institute uses[3] for this period a table compiled by the Metropolitan Life Insurance Company.

AGE GROUP III.

Table 3. Heights and Weights of Boys Between 5–14 Years (Without Clothes).

BOYS

Weight in Pounds — Without clothes

Height in Feet and Inches — without shoes

AGE	3-3	3-4	3-5	3-6	3-7	3-8	3-9	3-10	3-11	4	4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8	4-9	4-10	4-11	5	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6	6-1
5	35	38	39	41	42	46																													
6		36	39	41	42	44	46	48																											
7					42	43	[illegible]	48	49	54																									
8							45	48	50	53	54	57	59																						
9									50	53	55	58	60	62	62	65																			
10										53	55	58	60	62	65	68	69	71																	
11													61	61	65	68	71	77	77	78															
12														63	67	70	75	76	79	84	84	85													
13															67	71	75	78	80	85	86	91	98	99	100										
14															67	71	76	79	82	86	90	94	97	103	107	114	122								
15																		79	82	87	91	95	99	106	112	118	119	121	128	133					
16																						90	96	104	112	120	122	125	129	133	134	136			
17																								104	110	117	122	125	128	130	136	140	140		
18																									118	120	120	126	131	136	139	143	146		
19																										120	126	129	134	136	139	144	146	149	
20																											125	130	132	136	139	145	146	154	165

Table 4. Heights and Weights of Girls between 5–14 Years (Without Clothes).

GIRLS

Weight in Pounds — Without clothes

Height in Feet & Inches — without shoes

AGE	3-3	3-4	3-5	3-6	3-7	3-8	3-9	3-10	3-11	4	4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8	4-9	4-10	4-11	5-0	5-1	5-2	5-3	5-4	5-5
5	34	37	38	41	41	45																					
6		35	37	39	41	43	45	48																			
7				39	42	44	45	47	50																		
8						42	45	47	49	51	53	56															
9									49	51	53	56	59	63													
10											54	57	58	62	64	69											
11													60	62	63	68	70	75									
12														63	66	69	71	75	78	83	88	94					
13															65	68	73	76	80	86	89	94	99	104			
14																		78	83	88	93	96	100	104	107	112	114
15																				89	97	100	102	106	109	118	118
16																					100	104	108	111	116	[illegible]	121
17																						109	109	110	110	117	125
18																						103	106	107	112	114	120
19																						99	105	111	113	119	123
20																						99	111	114	114	115	125

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[3] Personal communication.

Of this table Professor Wood remarks (*loc. cit.*):

"Weight increases with height and age in normal children. A child who is short in stature for his age is apt to be under weight. This will help to explain how the mean weight of boys 16 years old and 60 inches high (90 lbs.) is less than the mean weight of boys 15 years old and 60 inches high (95 lbs.). Similarly, children very tall in relation to age are in some cases lighter than children of the same height but one year younger. The heights and weights of these tables were taken *without* clothing. Weight of clothing ranges from about 3 lbs. in five-year-old children to 6 or 7 lbs. in older pupils, and is slightly greater for boys' than girls' clothing." He adds[4]: The table was based "primarily on our statistics on several thousand boys and girls in our Horace Mann School, connected with Columbia University, and I tested the material, or rather checked it up by comparison with the statistics of Boas, Burk, and one or two other investigators in the field of the growth of children. The Horace Mann School is the largest private non-sectarian day school in the United States. The children, therefore, belong to a somewhat favored social class. I thought that the statistics would be above the average children in the general population, but by comparing our statistics with those gained in studies made in St. Louis, Kansas City, Oakland, California, and in some other cities, I came to the conclusion that the figures of children in the Horace Mann School were fairly representative of healthy children in the United States."

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[4] Personal communication.

Among other authors giving figures for this period are:

Boas	following	own data
Burk	"	own data
Carr	"	Bowditch
Chapin and Pisek	"	Boas and Burk
Dennett	"	own (?)
Dunn	"	Griffith, own (?)
Fischer	"	Holt, *i.e.* Bowditch
Graham	"	own (?)
Holt	"	Bowditch and Porter.
Kerley	"	Holt, *i.e.* Bowditch
Koplik	"	Budin, Camerer, own (?), Bowditch, Burk, MacDonald, and Hastings.
Life Extension Institute	"	Metropolitan Life Insurance Co.
Morse	"	Boas, Burk
Rachford	"	Porter, Chapin, Koplik, *et al.*
Rotch	"	Bowditch
Ruhräh	"	Boas, Burk, Griffith
Still	"	own (?)
Tuttle and Hurford ..	"	own (?)

Boas, F.: Science, N.S., I, Apr. 12, 1895, p. 402.
Burk, F.: Am. Jour. Psychol., April, 1898, IX, 253-326.
Carr, W. L.: Practice of Pediatrics, Phila. and New York, 1906, p. 76.
Chapin, H. D., and Pisek, G. R.: Dis. of Infants and Children, New York, Ed. 3, 1915, p. 35.
Dennett, R. H.: Simplified Infant Feeding, Phila., 1915, p. 325.
Dunn, C. H.: Pediatrics, Troy, N.Y., 1917, I, pp. 25 and 27.
Fischer, L.: Dis. of Infancy and Childhood, Phila., Ed. 7, 1917, p. 5.
Graham, F. E.: Dis. of Children, Phila., 1916, pp. 32 and 33.
Holt, L. E.: *loc. cit.*
Kerley, C. G.: *loc. cit.*, p. 41.
Koplik, H.: Dis. of Infancy and Childhood, New York and Philadelphia, Ed. 3, 1910, pp. 23-29.
Life Extension Institute: *loc. cit.*
Morse, J. L.: *loc. cit.*
Rachford, B. K. Dis. of Children, New York, 1912, p. 16.
Rotch, T. M.: Pediatrics, Phila., Ed. 5, 1906, p. 76.
Ruhräh, J.: Manual of Dis. of Infants and Children, Phila., Ed. 4, 1914, p. 24.
Still, G. F.: Common Disorders and Dis. of Childhood, London, Ed. 3, 1915, p. 3.
Tuttle, G. M., and Hurford, P. G.: Dis. of Children, Phila., Ed. 3, 1917, p. 24.

AGE GROUP IV.

Table 5. Heights and Weights of 221,819 Men of 15 or More Years of Age (With Clothes).

Age	Graded Average Weight in Lbs. with clothes																	
	Feet & Inches with shoes																	
	5-0	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6-0	6-1	6-2	6-3	6-4	6-5
15	107	109	112	115	118	122	126	130	134	138	142	147	152	157	162	167	172	177
16	109	111	114	117	120	124	128	132	136	140	144	149	154	159	164	169	174	179
17	111	113	116	119	122	126	130	134	138	142	146	151	156	161	166	171	176	181
18	113	115	118	121	124	128	132	136	140	144	148	153	158	163	168	173	178	183
19	115	117	120	123	126	130	134	138	142	146	150	155	160	165	170	175	180	185
20	117	119	122	125	128	132	136	140	144	148	152	156	161	166	171	176	[illegible]	186
21	118	120	123	126	130	134	138	141	145	149	153	157	162	167	172	177	182	187
22	119	121	124	127	131	135	139	142	146	150	154	158	163	168	173	178	183	188
23	120	122	125	128	132	136	140	143	147	151	155	159	164	169	175	180	185	190
24	121	123	126	129	133	137	141	144	148	152	166	160	165	171	177	182	187	192
25	122	124	126	129	133	137	141	145	149	153	167	162	167	173	179	184	189	194
26	123	125	127	130	134	138	142	146	150	154	158	163	168	174	180	186	191	196
27	124	126	128	131	134	138	142	146	150	154	158	163	169	175	181	187	192	197
28	125	127	129	132	185	139	143	147	151	155	159	164	170	176	182	188	193	198
29	126	128	130	133	136	140	144	148	152	156	160	165	171	177	183	189	194	199
30	126	128	130	133	136	140	144	148	152	156	161	166	172	178	184	190	196	201
31	127	129	131	134	137	141	145	149	153	157	162	167	173	179	185	191	197	202
32	127	129	131	134	137	141	145	149	154	158	163	168	174	180	186	192	198	203
33	127	129	131	134	137	141	145	149	154	159	164	169	175	181	187	193	199	204
34	128	130	132	135	138	142	146	150	155	160	165	170	176	182	188	194	200	206
35	128	130	132	135	138	142	146	150	155	160	165	170	176	182	189	195	201	207
36	129	131	133	136	139	143	147	151	156	161	166	171	177	183	190	196	202	208
37	129	131	133	136	140	144	148	152	157	162	167	172	178	184	191	197	203	209
38	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	198	204	210
39	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	199	205	211
40	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	206	212
41	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	207	213
42	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
43	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
44	133	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
45	133	135	137	140	143	147	151	155	160	165	170	176	183	188	195	202	209	215
46	134	136	138	141	144	148	152	156	161	166	171	177	183	189	196	203	210	216
47	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
48	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
49	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
50	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
51	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
52	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
53	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
54	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219
55 and up.	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219

Table 6. Heights and Weights of 136,504 Women of 15 or More Years of Age (With Clothes).

	Graded Average Weight in Lbs. with clothes																
	Feet and Inches with shoes																
Age	4-8	4-9	4-10	4-11	5-0	5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8	5-9	5-10	5-11	6-0
15	101	103	105	106	107	109	112	115	118	122	126	130	134	138	142	147	152
16	102	104	106	108	109	111	114	117	120	124	128	132	136	139	143	148	153
17	103	105	107	109	111	113	116	119	122	125	129	133	137	140	144	149	154
18	104	106	108	110	112	114	117	120	123	126	130	134	138	141	145	150	155
19	105	107	109	111	113	115	118	121	124	127	131	135	139	142	146	151	155
20	106	108	110	112	114	116	119	122	125	128	132	136	140	143	147	151	155
21	107	109	111	113	115	117	120	123	126	129	133	137	141	144	148	152	156
22	107	109	111	113	115	117	120	123	126	129	133	137	141	145	149	153	157
23	108	110	112	114	116	118	121	124	127	130	134	138	142	146	150	153	157
24	109	111	113	115	117	119	121	124	127	130	134	138	142	146	150	154	158
25	109	111	113	115	117	119	121	124	128	131	135	139	143	147	151	154	158
26	110	112	114	116	118	120	122	125	128	131	135	139	143	147	151	155	159
27	110	112	114	116	118	120	122	125	129	132	136	140	144	[illegible]	152	155	159
28	111	113	115	117	119	121	123	126	130	133	137	141	145	149	153	156	160
29	111	113	115	117	119	121	123	126	130	133	137	141	145	149	153	156	160
30	112	114	116	118	120	122	124	127	131	134	138	142	146	150	154	157	161
31	113	115	117	119	121	123	125	128	132	135	139	143	147	151	154	157	161
32	113	115	117	119	121	123	125	128	132	136	140	144	148	152	155	158	162
33	114	116	118	120	122	124	126	129	133	137	141	145	149	153	156	159	162
34	115	117	119	121	123	125	127	130	134	138	142	146	150	154	157	160	163
35	115	117	119	121	123	125	127	130	134	138	142	146	150	154	157	160	163
36	116	118	120	122	124	126	128	131	135	139	143	147	151	155	158	161	164
37	116	118	120	122	124	126	129	132	136	140	144	148	152	156	169	162	165
38	117	119	121	123	125	127	130	133	137	141	145	149	153	157	160	163	166
39	118	120	122	124	126	128	131	134	138	142	146	150	154	158	161	164	167
40	119	121	123	125	127	129	132	135	138	142	146	150	154	158	161	164	167
41	120	122	124	126	128	130	133	136	139	143	147	151	155	159	162	165	168
42	120	122	124	126	128	130	133	136	139	143	147	151	155	159	162	166	169
43	121	123	125	127	129	131	134	137	140	144	148	152	156	160	163	167	170
44	122	124	126	128	130	132	135	138	141	145	149	153	157	161	164	168	171
45	122	124	126	128	130	132	135	138	141	145	149	153	157	161	164	168	171
46	123	125	127	129	131	133	136	139	142	146	150	154	158	162	165	169	172
47	123	125	127	129	131	133	136	139	142	146	151	155	159	163	166	170	173
48	124	126	128	130	132	134	137	140	143	147	152	156	160	164	167	171	174
49	124	126	128	130	132	134	137	140	143	147	152	156	161	165	168	172	175
50	125	127	129	131	133	135	138	141	144	148	152	156	161	165	169	173	176
51	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
52	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
53	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
54	125	127	129	131	133	135	138	141	144	148	153	158	163	167	171	174	177
55	125	127	129	131	133	135	138	141	144	148	153	158	163	167	171	174	177

From the elaborate original volume the following abstracts are pertinent: The data were collected "Under modern conditions. . . confined to the policies issued in the U. S. and Canada (p. 5) . . . by 43 companies (p. 6). . . from the business of the years 1885 to 1908 inclusive. . . In 1885 the companies contributing their experience had 97% of the total insurance in force in all old-line companies in the U. S. and Canada, while in 1908 they had 90% of the total insurance. It may be said, therefore, that the material used in the investigation fairly represents the business of those countries (p. 8).

"In looking over the literature on anthropometrics one is struck with the dearth of reliable statistics. . . A comparison of the figures obtained by Messrs. Quetelet, Hutchinson, Macaulay and Foster will not be made, because the statistics are few and the results of academic interest only. The first table, based on a considerable volume of statistics, which took account of the ages, was prepared by the Medical Directors Assn. in 1897, and is known as the Shepherd Table.

Shepherd, G. R.: The Relation of Build (Height and Weight) to Longevity, Medical Examiner, July, 1899, ix, 209.

"It was based on 74,162 male applicants accepted for life insurance in the United States and Canada." (p. 11.) Later, "after a careful study of the facts available, the Committee (was) of the opinion that the Table of Heights and Weights in use among the companies (did) not express the actual facts and that it (was) desirable to establish a new Standard Table of Heights and Weights based upon a larger amount of data" than Shepherd's table (p. 108). They regarded standard lives as from 15% underweight to 25% overweight. "Cases which have been treated by the companies as substandard (were) excluded. (p. 109). . . The age. . . counted from the *nearest* birthday," not the next (p. 105). "The subjects were. . . measured in their shoes (p. 22). . . It should be observed that, generally speaking, applicants for insurance are in their ordinary street costume when weighed; overcoats, however, being removed and sometimes coats. This, of course, makes a difference in the weight according to the season of the year, the weight of the clothing of a man or woman in winter being about five or six pounds more than in summer in the northern sections of the United States, with a smaller variation in the southern sections. Furthermore, the heat of the summer is apt to reduce the actual weight below that of the winter. The desire to obtain averages which did not differentiate by season or by section of country, led to the choice of January (of the odd years) and July (of the even years) policy issues. . . The table. . . must not be considered therefore as applicable to any particular season of the year or to any particular section of the country, and accordingly due allowance should be made when making comparison with other data on a less comprehensive basis." (No statement seen about average weight of clothes for each sex.)

At the present time the War Department's figures, *minimum* as well as average, may be of interest for comparison:

Table 7. War Department Figures for Heights and Weights of Men (Without Clothes and Shoes.)

Age	Height in.	Weight lbs.	
		Av.	Min.
Under 18 years	62		110
At 18	64		115
At 19	64		120
At 20	64		125
At 21 & over	64	128	120
	65	130	122
	66	132	124
	67	134	126
	68	141	129
	69	148	133
	70	155	137
	71	162	142
	72	169	149
	73	176	156

McCain, H. P., Adjutant General, War Department, U. S. A. Recruiting Circular No. 2, Washington, Nov. 1, 1916.

A formula may be used instead of a table. Barker recently has given five such formulae, one in terms of pounds, four in terms of kg.

Barker, L. F.: The Clinical Diagnosis of Internal Dis., N. Y. and London, 1916, Vol. iii, 794.

Guthrie's Formula: Wt. in lbs. = 110 + (5.5 × number of inches taller than 5 ft.)

Bernhardt's Formula: Wt. in kg. =

$$\frac{\text{Ht. in cm.} \times \text{chest circumference in cm.}}{240}$$

Broca's Formula: Wt. in kg. = Ht. in cm. minus 100

Oeder's Formula: Wt. in kg. = (so complex that omitted here)

von Noorden's Formula: Wt. in kg. = Ht. in cm. × 0.455

The results of the application of the foregoing tables and formulae to a series of 20 normal men, partly medical students and partly out-patients with insignificant complaints, are given in Table 8. In order to compare these resulting weights, they have been expressed in pounds, without clothes. In each column we have then calculated the percentage error between the theoretical weight by that particular method and the actual weight. All these errors have been added (no matter whether the theoretical normal was higher or lower than the actual weight), the sum divided by 20 (in one column by 18), and the resulting "average per cent. error" put below the column. Beneath that again has been put the number of times that the theoretical exactly *agreed* with the actual, then the number of times it was *too high,* and finally the number of times it was *too low.* The results of these computations are summarized in the following conclusions:

Table 8. Comparison of Different Methods of Calculating Normal Weight.

Age Yrs	Height without shoes In.	Height without shoes cm	Chest circum cm	Weight pounds naked: Actual	Theoretical: Med-Act	USA	Guthrie	Bernhardt	Broca	vNoorden
23	65	165	82	113	132	130	138	125	143	165
22	64	162	85	121	127	128	132	127	137	162
34	66	167	85	127	142	132	143	131	148	167
22	67	170	83	129	138	134	148	130	154	170
22	71	180	84	129	155	162	170	139	176	180
24	67	170	87	136	140	134	148	136	154	170
25	70	178	87	137	154	155	165	142	172	178
24	68	173	86	143	144	141	154	137	161	173
27	72	183	88	148	167	169	176	148	183	183
32	69	175	91	150	155	148	159	146	165	175
28	70	178	87	151	156	155	165	142	172	178
24	67	170	89	151	140	134	148	140	154	170
22	69	175	91	153	146	148	159	146	165	175
23	68	173	91	156	143	141	154	145	161	173
24	69	175	88	158	148	148	159	142	165	175
25	69	175	94	165	149	148	159	151	165	175
30	72	183	98	166	170	169	176	164	183	183
32	72	183	90	169	172	169	176	151	183	183
34	74	188	97	179	186	--	187	168	194	188
22	76	193	97	194	180	—	198	172	207	193
Average % error:					7.3	7.3	9.5	5.5	13.1	19.7
No. of times correct:					0	1	0	2	1	5
" " " too high:					14	9	17	6	19	19
" " " " low:					6	8	3	12	0	1

I. The relative accuracy of the 6 methods (2 tables and 4 formulae) for estimating normal weight is, giving the best first:

1. Bernhardt's, with an error of about 6%.
2. U. S. Army's, with an error of about 7%.
3. Medico-Actuarial, with an error of about 7%.
4. Guthrie's, with an error of about 10%.
5. Broca's, with an error of about 13%.
6. Von Noorden's, with an error of about 20%.

II. The average weight of clothes in this small series of 20 men was eight (8) pounds (Boston in November).

III. It should be noted that the weight here discussed has been the "average" or "normal." The "ideal" weight, or that which indicates the greatest expectation of life, has been found by life insurance experts to be very different. In an individual under 35 years, for instance, the "ideal" weight is usually above the "average," and in an individual above 35 years of age below the "average."

* * *

THE IMMORAL WOMAN AS SEEN IN COURT: A PRELIMINARY REPORT.

By V. V. Anderson, M.D., M.A., Boston,
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It is not the purpose of this paper to discuss the magnitude and seriousness of the so-called vice problem. Numerous vice commission reports dealing with its various aspects are at hand. It was hoped, however, that a study of this sort might throw some light upon one phase of the situation, namely, the offender herself; what she is and what she needs; what her physical and mental condition is; and what main lines of treatment are indicated. More particularly was it our purpose to secure facts for orientation in regard to a certain group of women offenders passing through this court.

For the purpose of the study, a group of one hundred individuals representing "the run of the mine" in court was chosen. No other basis for selection was required than that each individual should have been arrested for an offense against chastity. An effort was made to examine each person more or less in the order in which she appeared in court.

The case records were collected during the months of January and February, 1917, at which time the Probation officers in court endeavored to secure an examination, wherever possible, of each woman offender of this type.

It is quite likely that the group selected is a representative one, and presents a fair picture of this type of offender in general. At least the situation is not overdrawn.

The following table of arrests would indicate that the worst side of the picture is not brought out; for the majority of our individuals are first offenders, not quite one-fifth being recidivists. The term "recidivist" is used to refer to those who have been arrested three or more times.

Table I.

Showing Frequency of Arrests among 100 Immoral Women in Court.

First offenders	56
Second offenders	25
Recidivists	19
Total	100

Eighty-one per cent. of our cases were either first or second offenders—individuals who from a purely legal and social point of view had not yet become serious problems. Likewise, the majority were young people, though none were under seventeen years, these being tried before the Juvenile Court.

Table II.

Showing Ages of 100 Immoral Women in Court.

Oldest age	54 yrs.
Youngest age	17 yrs.
Average age	26 yrs.
Total number under 30 yrs.	74

The average age is 26 years. The large percentage of our cases (74%) under 30 years is not at all surprising in view of the requirements for such a calling.

The frequency of alcoholism and drug addiction among immoral women is well recognized. While in this particular study no attempt was made to go seriously into this phase of the problem, to determine the relation of alcohol and drugs to the immoral conduct of these women, still a certain amount of data along these lines was secured. The following table indicates the proportion that showed use of such upon examination:

Table III.

Showing Proportion of 100 Immoral Women using Alcohol and Drugs.

Alcohol	34
Drugs	12
No evidence of either	54

Thirty-four per cent., or a good one-third, were in the habit of using alcohol. Twelve per cent., almost one out of every eight individuals, were drug habitués.

It is quite likely that a much larger percentage of these cases were using both alcohol and drugs than is shown here, for only those cases were recorded that gave evidence of such on examination.

The industrial inefficiency of the prostitute is a well-known fact. Their incompetence and consequent inability to support themselves by legitimate means has been offered as a most important factor underlying their delinquencies. Among this particular group of immoral women such wholesale inefficiency is not found. On the contrary, the number of individuals that seemed to be supporting themselves by legitimate means was surprising.

Table IV.

Showing Industrial Efficiency of 100 Immoral Women in Court.

Regularly employed	17%
Irregularly employed	33%
Odd jobs	2%
Never work	31%
Housework at home	17%

Seventeen per cent. were regularly employed, while about 50% seemed to be self-supporting. These facts are possibly better understood in connection with later tables of mental findings.

As above mentioned, the average age of the group is 26 years; all are, from a physical point of view, adults. The mental ages, however, as shown in the following table, would indicate that from the point of view of their mentality we are dealing with a much younger group of individuals, many having the mental level of children.[*]

Table V.

Showing the Mental Level of 100 Immoral Women in Court.

Between 8 and 9 yrs.	2%
Between 9 and 10 yrs.	10%
Between 10 and 11 yrs.	17%
Between 11 and 12 yrs.	20%
Subnormal (12-16 yrs.)	26%
Adult (16 yrs. +)	25%

Forty-nine per cent. of these individuals had a mental level below 12 years; 51% a mental level above 12 years.

Almost the same proportion of individuals as were found self-supporting were found to have a mental level over 12 years. Likewise, with a percentage of fifty not self-supporting, we find about the same number—49%—are under 12 years. These facts become more significant in the light of the following table:

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[*] In this connection it should be remembered that native intelligence reaches its complete development not far from sixteen years of age.

Table VI.

Showing the Mental Diagnosis of 100 Immoral Women in Court.

Normal	20%
Dull normal	32%
Feeble-minded	30%
Epileptic	6%
Alcoholic deterioration	2%
Drug deterioration	2%
Psychopath	7%
Psychosis	1%
	100%

Forty-eight per cent. are pathological mental types, among which feeble-mindedness ranks highest. Twenty per cent. were apparently normal, using the term "normal" in the very broadest sense, and meaning by it to include those individuals who gave evidence of good general intelligence, were stable, well balanced, and showed nothing pathological either in past history or present examination. To be sure, they all possessed traits of character that could be classed as delinquent; traits which varied greatly among the individuals themselves, and whch were present in greater proportion and frequency than is to be found in the non-criminal population.

Thirty-two per cent. were called subnormal—a class of individuals too intelligent and capable to be considered feeble-minded, and yet obviously inferior to the normally developed adult mind. This group might be better termed "The Dull Normal Group."

"A normal mind requires a healthy body to attain its highest efficiency." How necessary it is, then, to obtain a survey of the physical health of these individuals, as well as their mental condition. While feeble-mindedness cannot be cured, physical health may be restored.

Table VII.

Showing the Physical Condition of 100 Immoral Women in Court.

Good physical condition	14%
Fair physical condition	42%
Poor physical condition	36%
Bad physical condition	8%
	100%

Forty-four per cent. were in poor or bad physical condition, and that from diseases other than venereal (tuberculosis, asthma, heart disease, Bright's disease, rheumatism, pelvic tumors, drugs, alcohol, etc.), and were urgently in need of medical treatment.

The relationship which the physical condition of these individuals bore to their industrial efficiency is shown in the following table:

Table VIII.

Showing Relationship of Physical Condition to Industrial Efficiency of 100 Immoral Women in Court.

Physical Condition.

	Good Physical Condition	Fair Physical Condition	Poor Physical Condition	Bad Physical Condition	Totals
Regularly employed	1	12	3	1	17
Irregularly employed	5	14	12	2	33
Odd jobs	0	0	1	1	2
At home	4	5	8	0	17
Do not work	4	11	12	4	31
Totals	14	42	36	8	100

Thirty-two per cent. were in good or fair physical condition, and were self-supporting.

Eighteen per cent. were in poor or bad physical condition, and were self-supporting.

Twenty-four per cent. were in good or fair physical condition, and were not self-supporting.

Twenty-six per cent. were in poor or bad physical condition, and were not self-supporting.

Syphilis and gonorrhea were not included in the above list of diseases causing impaired condition of health referred to, for the reason that it seemed best, in view of their grave social significance, to discuss them separately.

Table IX.

Showing Frequency of Venereal Disease among 100 Immoral Women in Court.

Syphilis	39
Gonorrhea	32
Combined	10
Total No. with Venereal Disease	61

Among these one hundred individuals there were thirty-nine cases of syphilis, and thirty-two cases of gonorrhea. In ten cases the condition was combined. In all, sixty-one individuals were suffering from venereal disease (this is a conservative figure, as only positive bloods and smears were counted). These two conditions rank among the greatest of all social evils, and that principally because their nature is grasped only by a few. Medical men recognize the seriousness of the situation, but the full importance of a general education of the public along these lines is not appreciated.

Syphilis and gonorrhea form a combination possibly as productive of evil as any scourge that has ever afflicted mankind. These two conditions are striking at the very sources of life, and deteriorating the human race. The terrible mortality among the new-born, caused by hereditary syphilis, the high percentage of miscarriages associated with this condition, the fact that this disease ranks first in its ability to cause destructive diseases of the nervous system, the fact that in its wake follow idiocy, epilepsy, feeble-mindedness, insanity, locomotor ataxia and such, make the early recogntion and treatment of syphilis a matter of the gravest importance to the general public.

The seriousness of gonorrhea, especially to women, and the growing army infected, is a source of much alarm to serious-minded students of the subject. Few diseases afflict women that are fraught with more permanent harm. It exists in every degree of severity. In some it produces only the very mildest symptoms, in others the fulminating signs are present—acute inflammation of the tubes and ovaries, abscesses and peritonitis. Between these lie all degree of pelvic ills, acute and chronic. This condition is the most prolific source of extra-uterine pregnancies, spontaneous abortions and sterility. It is a large and important factor in causing blindness and many other serious conditions.

In short, we have in these two conditions diseases of such grave significance to society in general, and the individual in particular, that, providing they exist in such frequency as above indicated (61%) among this group of offenders, a serious duty becomes imposed upon those who would protect the general public, while seeking to do the best possible for the individual. And this duty consists in having every offender who through known illicit sexual relations has exposed himself or herself to the danger of infection with syphilis and gonorrhea examined, to determine whether such a condition exists. And this not only in the light of protecting society from a serious menace to public health, but as a matter of common humane interest in the individual. It is the common belief that these conditions are frequent only among the common prostitute, and that a carefully gotten social history will reveal those who should have an examination made for venereal diseases, that the young individual, the first offender, who has not been promiscuous, is liable to be free from such.

The following table is significant, particularly in view of the fact that the majority were first offenders and were young individuals.

TABLE X.

Showing Relationship of Venereal Disease to Frequency of Offense among 100 Immoral Women in Court.

	FIRST OFFENDERS 56	SECOND OFFENDERS 25	RECIDIVISTS 19
Syphilis	24	8	7
Gonorrhea	21	9	2
Combined	8	1	1
Total number with venereal disease	37	16	10

Fifty-six were first offenders, 25 were second offenders, and 19 were recidivists. Of these 56 first offenders, 66%, or two-thirds, were suffering from either syphilis or gonorrhea. The fact that only 42% of the recidivists showed positive laboratory findings is possibly to be explained in the light of the well-known interference of alcohol with the Wassermann reaction (recent alcoholism having been found common among the recidivists); also some were undoubtedly undergoing treatment at the time. Finally, it must be borne in mind that the common prostitute, as time goes on, becomes more adept in protecting herself from venereal disease.

There is only one safe and sane method of finding out whether an individual needs an examination for venereal disease, and that is to determine exposure to such through having had illicit sexual relations.

Inasmuch as behàvior finds its fullest explanation in the mental life of an individual, we have been led to expect a close correlation between abnormal mental conditions and misconduct. Such is the case in this group studied. In fact, so marked is the correlation that one can practically say that the greatest distinction between the first offender and the recidivist is a psychological one, and consists of a difference in mentality of the individuals themselves.

TABLE XI.

Showing Relation of Mentality to Frequency of Offense among 100 Immoral Women in Court.

	FIRST OFFENDERS	SECOND OFFENDERS	RECIDIVISTS	TOTALS
Normal	16	3	1	20
Dull normal	19	11	2	32
Feeble-minded	11	8	11	30
Psychopath	4	0	3	7
Epilepsy	3	2	1	6
Alcoholic deterioration	1	0	1	2
Drug deterioration	1	1	0	2
Psychosis	1	0	0	1
Totals	56	25	19	100

Thirty-nine and three-tenths per cent. of first offenders, 47.2% of second offenders, and 84.2% of recidivists were suffering from serious mental handicaps. As it can be predicted that on a hot summer day the majority of pedestrians will be found on the shady side of the street, so can it be expected that a certain group of offenders, all things being equal, will find themselves unable to measure up to the social standards of the complex community life of today, and will appear again and again in court.

Preventive criminology would consist in determining beforehand the members of this group, and marking them for special supervision, such supervision as would take into consideration their peculiar needs and their special adaptabilities, if any success in adjustment is to be attained.

Having drawn attention to the physical condition, the mental condition, the industrial efficiency, the frequency of venereal diseases, alcohol and drugs among these women, it might be worth while to consider the constructive aspect of the situation; for, after all, it is the question of human salvage that we are most interested in here, and not the particular kind of punishment needed.

Table XII.

Showing Related Mental and Physical Condition among 100 Immoral Women in Court.

Mental Condition	Physical Condition			
	Good	Fair	Poor	Bad
Normal	3	8	6	3
Dull normal	5	11	15	1
Feeble-minded	2	18	8	2
Epilepsy	1	3	2	0
Alcoholic deterioration	0	0	2	0
Drug deterioration	0	0	0	2
Psychopath	3	1	3	0
Psychosis	0	1	0	0
Total	14	42	36	8

Twenty-seven per cent. possessed good or fair mentality, and were in good or fair physical condition.

Twenty-five per cent. possessed good or fair mentality, and were in poor or bad physical condition.

Twenty-nine per cent. were in poor or bad mental condition, and in good or fair physical condition.

Nineteen per cent. were in poor or bad mental condition, and in poor or bad physical condition.

In short, a certain number of our cases (27%) were in such physical and mental condition as would enable them to return to the community.

Twenty-five per cent. were, from a mental point of view, capable of adjustment under intelligent supervision, but were physically in need of medical treatment.

Twenty-nine per cent. were suffering from such mental handicaps as to render it unlikely that they would conduct themselves normally unless under very careful supervision—supervision suited to the special needs of their case.

Nineteen per cent. were in such poor or bad mental condition, and such poor or bad physical condition, as to render outside adjustment risky, but were in need of prolonged treatment under detention.

SUMMARY.

In this study an attempt was made to secure for examination a group of 100 women offenders in court, who might fairly well represent the so-called offender against chastity.

The group selected contained 56 first offenders, 25 second offenders and 19 recidivists. All told, 81% were either first or second offenders.

The average age was 26 years.

Alcoholism was found in 34 persons, and drug addiction in 12.

Forty-nine per cent. had a mental level below 12 years; 51% were above 12 years.

Forty-eight per cent. were suffering from serious mental handicaps, among which feeblemindedness ranked highest (30%).

Forty-four per cent. were in poor or bad physical condition from diseases other than venereal, and were in need of medical treatment.

More than three times as many persons who were regularly employed were found in good or fair physical condition as were found in poor or bad physical condition. The restoration of an individual's health might well be one of the most effective means for securing successful probation in her case: for the woman in bad health stood about one-third the chance of the woman in good health for regular employment.

Syphilis and gonorrhea were found present in 61% of these cases. There is no satisfactory method of selecting the particular individuals among known immoral women in court who should and who should not have an examination for venereal disease, for the first offender is just as liable to be infected as the common prostitute. In these cases 66% of the first offenders were suffering from syphilis or gonorrhea.

There is a very high correlation between the frequency of offense and the mental condition of these individuals. Thirty-nine and three tenths per cent. of first offenders, 47.2% of second offenders, and 84.2% of recidivists were suffering from serious mental handicaps. Preventive Criminology looks towards the ascertainment of the mental condition of such offenders in advance of their treatment.

Taking the group as a whole, about 27% were in such good physical and mental condition as would enable them, under probation, to return to the community.

Twenty-five per cent. were, from a mental point of view, capable of adjusting themselves under well-planned probationary supervision, but were physically in need of urgent medical treatment.

Twenty-nine per cent. were suffering from such mental handicaps as to render it unlikely that they would conduct themselves normally in the community unless under very special probationary supervision—supervision suited to the peculiar needs of each case.

Nineteen per cent. were in such poor or bad mental condition, and such poor or bad physical condition as to render any attempt at outside adjustment inadvisable, and were in need of prolonged treatment under detention.

THE DIFFERENTIATION OF PSYCHOTIC FROM NEUROTIC CONDITIONS.*

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IN Tuke's "Dictionary of Psychological Medicine," published in 1892, are found these definitions:

"Psychosis,—a mental affection.
Psychoneurosis,—a mental disease."

To be sure, these definitions are many years old, and since then the situation has been somewhat clarified, but to many practitioners and laymen the clinical differentiation of psychotic from neurotic conditions remains about as nebulous as the above-quoted definitions.

A part of this vagueness of understanding has been due to the relationship between psychoses and insanity, but this difficulty is resolved by recognizing that insanity is a social condition—a question of conduct in a given environment, and a question primarily of legal rather than medical definition. It need hardly be stated that many people are judged insane who have no psychoses, while many psychotic individuals are never judged insane. Many a wild hysteric has been committed as insane, and rightly, because of his or her conduct, but not because of suffering from a psychosis; and many a senile dement has been lovingly cared for at home as a sweet old grandmother. Clinically, we are familiar with the diagnosis of pre-dementia precox and paresis sine paresi in individuals whose conduct does not at the time warrant commitment as insane.

The matter of insanity, then, must be considered apart from that of the existence of a psychosis; for insanity, as has often been stated in court, can be described but cannot be defined. In fact, Lord Justice Blackburn is quoted by Church and Peterson as saying regarding insanity: "I have read every definition which I could meet with and never was satisfied with one of them, and have endeavored in vain to make one satisfactory to myself. I verily believe that it is not in human power to do so."

The differentiation of a psychosis from a neurosis is, however, a matter of prime importance and worthy of discussion. To the layman a vast gulf divides the psychotic from the "only nervous." He will go to the psychopathic hospital readily, but cannot be dragged to a state institution. He will go to a nervine hospital, but hesitates even to pass by a sanitarium for mental cases. His sick neighbors are perhaps at times insane, but his own relatives are only "very nervous." He will consult a neurologist but hesitates to call on a psychiatrist. The family practitioner prefers to consider a case "nervous," whereas the psychiatrist may often remind one of the old Quaker who is famed for saying, "Every one is queer but me and thee, and sometimes thee is a little queer."

Surely some clinical standard should be found that will help clarify this situation.

In alcoholic intoxication the law has recognized the distinction between delirium tremens and alcoholic hallucinoses, and provides for the exclusion of the former and the admission of the latter to the Boston Psychopathic Hospital.

Kraepelin has given a table for differentiating these two conditions, in which ten factors are considered, as follows: Lucidity and orientation are absent in delirium tremens, present in alcoholic hallucinoses. The sensorium is clouded in the former, clear in the latter. Hallucinations are largely of sight in tremens and of hearing in alcoholic hallucinoses. Suggestibility is increased in the former, normal in the latter. Restlessness is increased in tremens, absent in the other condition. Consistent delusions are absent in tremens and present in alcoholic hallucinoses. Coarse tremor is present in the first condition, absent in the second. The course of the disease is rapid in tremens and slow in alcoholic hallucinoses, and the termination of the former is by crisis and of the latter by lysis.

In other words, as a general thing, in delirium tremens there is evidence of a toxic interference with the receipt of stimuli and an increased reaction through the vegetative nervous system to emotional stimuli, whereas in alcoholic hallucinoses the evidence of interference with the receipt of stimuli is seemingly lacking, and instead of an increased reaction through the vegetative nervous system to emotional stimuli there is often a striking lack of such reaction.

A similar distinction can be seen in cases where another toxic agent is at work, namely, syphilis. In pre-paretic cases, the symptoms suggest neurasthenia and exhibit an increased reaction through the vegetative nervous system to emotional stimuli, whereas in full-blown paresis there is again a striking lack of such reaction.

In addition to alcohol and syphilis, a third agent that reacts upon the body with symptoms varying through the whole gamut of neurotic and psychotic conditions is one upon which much interest and investigation is now focused, namely, shell shock.

Here, then, are found a chemical agency, a microbic agency, and a purely physical agency, each of which produces in man symptoms varying from mild neuroses to severe psychoses.

Study of this new agency, namely, shell shock, promises new and invaluable knowledge in the fields of physiology, and especially psychiatry.

In a recent article on "The Psychology of Fear," Sir Robert Armstrong-Jones has written most illuminatingly upon the subject. At the risk of boring those of you who have read his article, a short abstract of some of the knowledge and theories that he has presented will be given. He states "that in every emotion there is a cognitive and active and an affective experience, and that the emotions are the expression of—or, according to some, are themselves expressed in—characteristic instinctive acts." Fear, which in its various forms is an universal and fundamental human experience, is expressed physiologically in varying degrees by inhibition of all visceral movements, contraction of the blood-vessels, lowering of surface temperature, sweating, cessation of the flow of saliva, dilatation of the pupils, erection of the hair, increased cardiac and respiratory activity, and tremblings and twitchings of muscles, especially of the face. In addition to these direct emotional reactions, through the vegetative nervous system, there is an indirect action through stimulation of the adrenal glands that results in an increased sugar excretion from the liver into the blood for the use of the muscles, a diversion of blood from the abdominal viscera into the heart, lungs, and central nervous system, an increased coagulability of the blood, and an increased blood-pressure. This adrenal secretion augments the effect of the emotions and also helps to prolong and sustain it, and may be likened crudely to the ignition in an automobile, which at first is accomplished by the battery, and then prolonged by the action of the magneto.

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* Read at the meeting of the Boston Society of Psychiatry and Neurology, October 18, 1917.

Such, according to our present knowledge of physiology, is the mechanism of the relationship between emotional activity and physical reflex action.

In shell shock it has been suggested that, owing to the intensity of the emotional stimuli, a dissociation of the cerebrospinal and the vegetative nervous systems takes place, resulting in uncontrolled and unregulated action of organs innervated by the autonomic system.

The following thesis is advanced for consideration. In the neuroses, neurasthenia, psychasthenia, hysteria, etc., there is a hyper-reactivity through the vegetative nervous system to emotional stimuli, whereas in the psychoses there is a hypo-reactivity through this system to such stimuli.

The following observations and cases are quoted to illustrate this thesis:

In the syphilo-psychoses (the mental disease groups which have been suggested by Dr. Southard will be considered) there are recognized the syphilitic neurasthenics, the pre-paretics, the cases of paresis sine paresi, and the paretics.

CASE A. A case of neurasthenic syphilis, who complained of being "all in." "Could not think." Did not want to go home to his family, too nervous to stay at his office. Admitted luetic infection several years previous and had had thorough treatment under skilled hands. Physical examination showed increased reflexes, healed ulcers over the shins, and a general hypersensitiveness to emotional stimulation. Appetite and sleep poor. Bowels sluggish. With rest, baths, and psychotherapy he gained in weight and poise, and has been able to conduct his business for several years with marked success.

CASE B came to the Out-Patient Department of the Psychopathic Hospital because when he got out of bed he could not put one foot readily into his slipper. His speech was slightly thickened and his pupils sluggish and irregular. He was referred to the hospital for observation, where all laboratory tests were found positive for paresis.

CASE C complained of inability to concentrate his mind. Did not feel well. Worried over an inability to pronounce certain words clearly. Was restless, anxious about every physical symptom. Physical examination showed almost absent knee jerks, irregular pupils that usually failed to react to light. Laboratory tests were positive for general paresis. With intravenous salvarsan, baths, and psychotherapy, he improved in physical condition and seemingly became able to enunciate more clearly. He lost many of his worries and returned home in much better shape. When last seen he was not commitable, and could scarcely be classed as psychotic, although from the laboratory point of view a clear case of paresis.

A typical cases of paresis need not be cited, as the changed affectivity is recognized as an early symptom almost always present. The common immunity of the paretic to unpleasant aftereffects from lumbar puncture is recognized, and when a case has nausea, headache, or dizziness after a lumbar puncture a positive Wassermann reaction is not expected.

In the hypo-phrenoses—the feeble-minded—keenness of reaction to emotional stimuli is not expected. In case of fire at a feeble-minded school it has been remarked that the patients are less liable to be panic-stricken than the nurses and attendants.

CASE D. A young man seen in the Out-Patient Department of the Psychopathic Hospital. He was so cheerful and well nourished and emotionally placid, in spite of a series of major operations of doing and undoing a gastro-enterostomy, repairing a hernia, and breaking up abdominal adhesions, performed at the Massachusetts General, the Carney, and the Brigham Hospitals, that he was given a Binet test and proved to be but nine years of age mentally.

CASE E. A high-grade moron of gluttonous habits, who insists on constantly overeating. Often after excessive eating, he will easily regurgitate part of his meal with as little discomfort as an overturned bottle.

Among the epileptoses a change in affectivity is noted that may gradually develop and remain present, or may precede or follow individual seizures.

CASE F. A woman, eighty years of age, who since childhood has had epileptic attacks varying in frequency from none to fifteen a week. Within the past twelve years she has gradually developed a psychotic condition, and now shows almost complete lack of memory, and at times confusion and irritability. Her mother, herself, her daughter and her granddaughter have suffered from epilepsy. Now that her psychotic condition has developed she is placid, and cheerful most of the time, going driving daily, and has shown practically no physical enfeeblement within the past five years.

Among the pharmaco-psychoses—the alcoholic and drug cases—the distinction between delirium tremens and alcoholic hallucinoses has already been considered.

Among the encephalo-psychoses—the coarse brain disease cases—are to be found cases that in their early stages are classed as neurasthenics that later show marked changes in affectivity.

The somato-psychoses are seldom seen in their initial stages by psychiatrists. Experienced general practitioners, however, recognize in typhoids, cardiac, pneumonic, and puerperal cases, a change in affectivity, a keen alertness, a disregard of normal physical weakness and disabling symptoms that puts them on their guard to prevent sudden elopement or tragedy. Osler states in his "Practice of Medicine" that acute mania occurs as a complication of various somatic conditions, but gives no hint to assist a practitioner in recognizing the onset of such a condition.

Case G. A case of marked cardiac decompensation. If unwatched, he would spring out of bed and run out of his room and show evidence of strength and agility absolutely incompatible with his physical condition.

Among the gerio-psychoses are again to be found cases varying in symptoms from neurasthenias to frank psychoses. Affectivity changes are an early symptom of psychotic change, and the virility and endurance of senile dements often far surpasses that of non-psychotic elders.

Case H. A woman of nearly eighty years, blind, deaf, toothless, and partly crippled with arthritis, has often required two or three nurses to hold her when her nails have to be manicured.

Case I. A man of seventy-five, who had not eaten of his own volition for months, requires two strong male nurses and a doctor when he is tube fed.

Among the schizo-phrenoses—the dementia precox cases—change in affectivity is an early and almost constant symptom. In fact, it may be suggested that "the shut-in personality" may possibly better be thought of as a "shut-off personality"—an individual in whom the connection between emotional stimuli and normal reaction through the vegetative nervous system is irregular and labile, predisposed to rupture under environmental or physical strain.

Case J. A woman of thirty-five, a dementia precox case of several years' standing, who required the removal of several old teeth. She was seized, heavily etherized, and had four teeth extracted. When seen a quarter of an hour later, she was sitting on the edge of her bed, asking to go out into the garden, and showing no nausea or evidence of shock from her uncomfortable experience.

The cyclo-thymoses—the manic-depressive cases—also show types varying in symptoms from mild neurasthenic-like depressions to frank psychoses.

These cases imperatively call for an early diagnosis, for from among these cases come the sudden suicides and maniacal murders. When the hard-working business man or military officer, with heavy cares and responsibilities, ceases to be fatigued by excessive labor, craves more work, less sleep, and is indifferent to nourishment, danger should be scented and relief from emotional strain secured.

Among the frankly maniacal cases, excessive motor activity, without apparent fatigue or need of sleep, is often marked. Exposure of the person to cold and wet seldom, if ever, results in colds or reflex congestion of the nasal mucous membranes.

Case K. A woman of sixty, who had usually suffered from frequent colds and so-called "hay fever," upon the development of a prolonged agitated depression, ceased to have any signs or symptoms of such vasomotor disturbance. She also failed to show any nausea or evidence of shock after being heavily etherized.

Case L. An elderly woman who had suffered for years from asthmatic attacks ceased abruptly to have these attacks subsequent to the onset of a long depression.

Among the psychoneuroses there is universally recognized a relationship between emotional disturbances and the physical symptoms that, to a greater or less degree, incapacitate them for effective life and happiness. In the neurasthenias these symptoms seemingly represent excessive reactions through the vegetative nervous system in the field innervated thereby—the digestive system, the urinary organs, the genital organs, the respiratory apparatus, the cardio-vascular system, etc.; while in hysterics and shell shock cases there is seemingly an overflow of reflex stimulation that, in addition, inhibits various muscular activities usually controlled through the cerebrospinal system.

The scope of this paper does not permit of a discussion of the etiology of the psychoneuroses. That the emotions play an important part in these conditions is generally admitted. That the emotions react physiologically through the vegetatative nervous system is also admitted. That recognition by a patient of this reaction through the vegetative nervous system gives rise to secondary emotions, and that these secondary emotions start a secondary reaction, and so on, with the formation of a vicious circle that becomes more and more complex the longer it spins, is also recognized.

Whether the genesis of the emotional disturbance is due to intra-uterine or extra-uterine sex trauma, to buried complexes, or due to congenital somatic deficiencies; whether the type or intensity of the stimulus, or the congenital or acquired weakness of the patient is the determining etiological factor—all this is aside from the scope of this paper.

Among the psycho-pathoses—the psychopathic individuals—there may be assumed to be a lability of connection between emotional activity and the vegetative nervous system that in the genius enables him to surmount difficulties with exceptional success, and disregard the distractions and environmental inhibitions of more common individuals—a lability which in another member of the same family, with failure, predisposes to mental disease.

CONCLUSIONS.

No attempt has been made to define insanity, which may properly be considered capable of description, but not of definition.

No attempt has been made to consider the etiology of various types of psychoses.

The suggestion is made that clarity of diagnosis will be furthered and consequently great help rendered in prognosis and treatment if a clear line of demarkation can be drawn between the psychoses and the neuroses; that cases of whatever etiology—alcoholic, syphilitic, determined or undetermined—be considered neuroses so long as they show hyperactivity of reaction through the vegetative nervous system to emotional stimuli, but that they be considered psychoses when there is found to exist evidence of hypo-activity of reaction through the vegetative nervous system to adequate emotional stimuli.

Being contribution of the Massachusetts Commission on Mental Diseases No. 202.1917.22. The previous contribution was No. 201.1917.21 by Dr. E. E. Southard, entitled "On the Focality of Microscopic Brain Lesions Found in Dementia Precox," appearing in the Transactions of the Association of American Physicians, 1917.

THE UROBILIN CONTENT OF THE FECES AS A MEASURE OF RATE OF BLOOD DESTRUCTION.

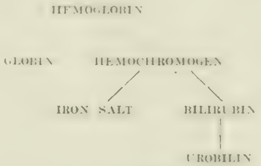
By Francis H. McCrudden, M.D., Boston.

[From the Robert Breck Brigham Hospital, Boston.]

During the past three years the spleen has been removed as a therapeutic measure in such cases of pernicious anemia as show a high urobilin excretion, and there is a considerable literature on the subject.[1] But this literature deals largely with the practical therapeutic value of the operation and only slightly with the significance of the high urobilin. Charting red count and urobilin excretion in parallel, as I have done in the present paper, brings out graphically the relationship between high urobilin excretion and rapid hemolysis.

Hemoglobin, like all other compounds of the body, undergoes catabolism and anabolism; old hemoglobin is being continuously broken down and new hemoglobin built up. In order to preserve the normal red count at 5,000,000, and to maintain the hemoglobin at 100%, hemoglobin and red cells must be built up at the same rate as they are destroyed. If the rate of blood destruction is greater than the rate of formation, anemia will ensue. All anemias are due either to (1) a *decreased rate of blood formation*, or (2) an *increased rate of blood destruction.*

The steps in hemoglobin anabolism are not known, but the steps in the catabolic process may be schematized as follows:



The first products of hemoglobin destruction are globin and hemochromogen. The hemochromogen breaks down and gives an iron salt and bilirubin. The iron salt is retained by the liver. The bilirubin appears in the bile, and in the intestine it is quickly reduced to urobilin. Urobilin is, then, an end-product of hemoglobin catabolism, and the amount formed is proportional to the amount of hemoglobin destroyed.

In any case of pernicious anemia it is important to determine whether the condition is the result of decreased blood formation or of increased blood destruction.* Since the amount of urobilin formed is proportional to the amount of hemoglobin destroyed, a determination of the amount of urobilin formed would give us this information. But some of the urobilin in the bile becomes chemically changed, and some of it becomes reabsorbed, so that we cannot calculate the amount of hemoglobin destroyed from the urobilin content of the feces.†

We can, however, compare the urobilin in the feces in any case with the normal and get figures which are of sufficient accuracy for clinical purposes.‡

The observations recorded here were made on two women with pernicious anemia—Mrs. N. and Mrs. O.—who were treated by all the usual methods, including transfusion and splenectomy.

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* It is in the latter type only that splenectomy is indicated. The operation was recommended and carried out at about the same time by Eppinger,[2] by Decastello,[3] and by Klemperer and Hirschfeld.[4] Eppinger was led to do it because of the observation that splenectomy lowers the urobilin excretion; Decastello because of the clinical improvement following the operation in cases of Banti's disease and hemolytic jaundice; and Klemperer and Hirschfeld because of the polycythemia observed following splenectomy for certain conditions.

† In cases where a biliary fistula has made it possible to collect all the bile, the normal rate of blood destruction has been determined from the amount of bilirubin formed.[5] In one such case, for example, 500 to 1100 cc. of bile per day, containing an average of 0.5 grams bilirubin was found, an amount which corresponds to 0.5 grams hemochromogen, 12.5 grams hemoglobin or 90 grams blood. (Blood contains 14% hemoglobin, and hemoglobin contains 4% hemochromogen.) This would indicate a destruction of about 2% per day of the total blood.

‡ Other factors besides blood destruction influence urobilin excretion.[6]

and who showed remissions and relapses. The urobilin was determined by the method of Wilbur and Addis.[7]

The charts are nearly self-explanatory. Abscissae indicate time; ordinates indicate amount of urobilin and number of red cells. Individual red cell counts are recorded as crosses, urobilin estimations as circles. The cross-hatched areas show the normal urobilin for comparison. The broken lines show average urobilin excretion over the period covered by the line.

Charts and tables, 1, 2, and 3—periods of remission show a rising blood count and a normal urobilin output. The low urobilin output indicates a low rate of blood destruction. The rise in the red count shows that formation of red cells and hemoglobin was faster than destruction.

Charts and tables 4 and 5 show the high urobilin output at times when the red count was falling. At these periods blood destruction was very rapid. The falling red count shows that destruction of red cells and hemoglobin was faster than formation.

Charts 6 and 7 show changes in the rate of blood destruction during the period of observation. In both cases the red count was at first falling; later, rising. Correspondingly, the average urobilin excretion was at first high and, later, lower.

TABLE I. PATIENT N.

URObilin Excretion Low; Red Count Rising.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
June 26 ...	—	2,400,000	—
June 27 ...	—	—	—
June 28 ...	—	—	—
June 29 ...	—	—	—
June 30 ...	—	—	—
July 1	—	—	—
July 2-3 ...	12.45 A.M.	—	4,000
July 3-4 ...	3.00 P.M.	—	6,000
July 4-5 ...	9.05 A.M.	2,417,000	12,000
July 5-6 ..	11.10 P.M. 4.15 A.M.	—	8,000
July 6-7 ...	6.25 P.M.	—	1,400
July 7-8 ...	none	—	—
July 8-9 ...	6.45 P.M. 9.10 P.M.	—	12,000
July 9	—	—	—
July 10	—	—	—
July 11	—	—	—
July 12	—	2,517,000	—

Average urobilin 7133

TABLE II. PATIENT N.

UROBILIN EXCRETION LOW; RED COUNT RISING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
April 8-9 ..	10.05 A.M.	1,800,000	3,000
April 9-10 .	10.15 A.M.	—	12,000
April 10-11.	10.10 A.M.	—	1,600
April 11-12.	6.45 P.M.	—	9,000
April 12-13.	11.45 P.M.	2,000,000	10,000

Average urobilin 7,100

TABLE III. PATIENT O.

UROBILIN EXCRETION LOW; RED COUNT RISING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
Mar. 1	—	1,980,000	—
Mar. 2	—	—	—
Mar. 3	—	—	—
Mar. 4-5 ..	7.15 A.M.	—	8,000
Mar. 5-6 ..	4.00 A.M.	—	3,600
Mar. 6-7 ..	2.30 A.M.	—	7,200
Mar. 7-8 ..	2.30 A.M.	—	800
Mar. 8-9 ..	no stool	—	—
Mar. 9-10 .	3.45 P.M.	3,120,000	10,000
Mar. 10-11.	7.00 A.M.		
Mar. 11-12.	1.10 A.M.	—	8,000

Average urobilin 6,267

TABLE IV. PATIENT N.

UROBILIN EXCRETION HIGH; RED COUNT FALLING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
June 9-10..	4.15 P.M.	1,400,000	14,000
June 10-11.	3.20 P.M. 9.45 A.M.	— —	— 20,000
June 11-12.	—	—	—
June 12-13.	12.00 P.M.	—	32,000
June 13-14.	—	—	—
June 14-15.	6.10 A.M.	—	14,000
June 15-16.	—	—	—
June 16-17.	7.00 A.M.	—	16,000
June 17-18.	1.15 P.M.	1,270,000	16,000

Average urobilin 18,666

TABLE V. PATIENT N.

UROBILIN EXCRETION HIGH; RED COUNT FALLING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
Jan. 25-26	10.45 A.M. 2.20 P.M.	2,490,000	19,200
Jan. 26-27..	8.10 P.M.	—	24,600
Jan. 27-28..	none	—	—
Jan. 28-29.	9.20 A.M. 11.50 A.M.	—	44,800
Jan. 29-30..	1.30 P.M.	—	16,000
Jan. 30-31..	5.10 P.M.	—	32,000
Jan. 31-1.. Feb. 1-2...	not saved	2,200,000	—
Feb. 2-3...	6.30 A.M. 9.50 A.M.	—	22,400

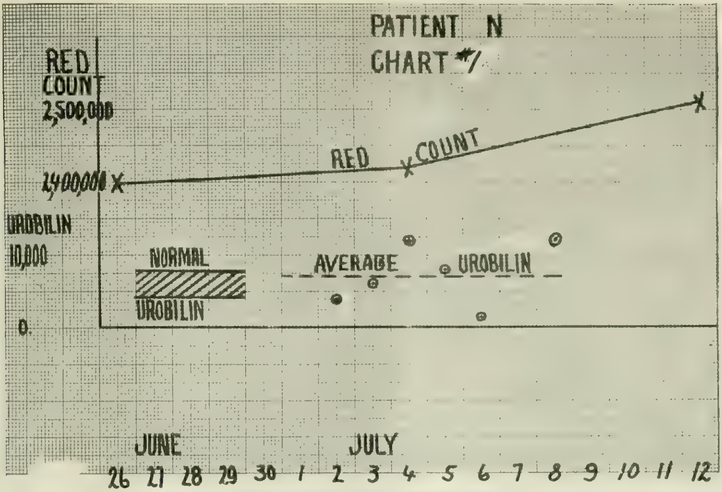
Average urobilin 26,400

TABLE VI. PATIENT O.

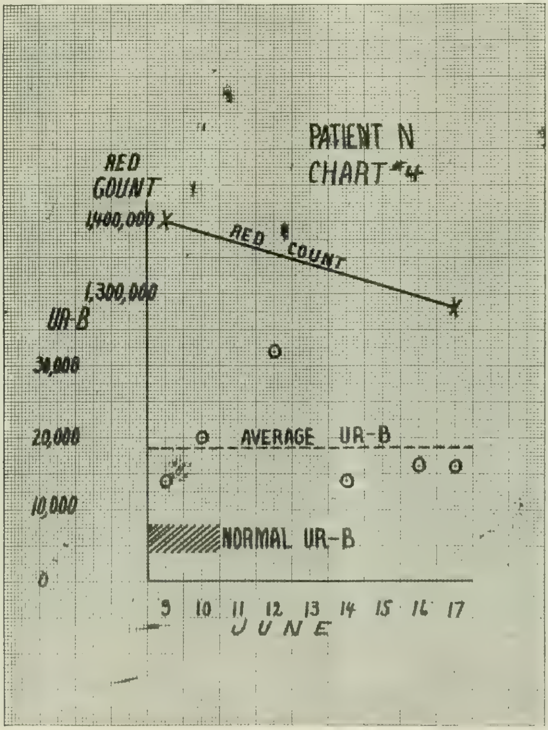
UROBILIN EXCRETION AT FIRST HIGH, LATER LOWER; RED COUNT AT FIRST FALLING, LATER RISING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
Jan. 18.....	—	2,520,000	—
Jan. 19.....	—	—	—
Jan. 20.....	—	—	—
Jan. 21.....	—	—	—
Jan. 22.....	—	—	—
Jan. 23.....	—	—	—
Jan. 24-25..	9.30 A.M.	-	51,200
Jan. 25-26..	6.15 P.M.	-	57,600
Jan. 26-27..	5.00 P.M.	1,708,000	25,600
Jan. 27-28..	9.50 P.M.	—	11,840
Jan. 28-29..	7.30 P.M.	—	28,800
Jan. 29-30..	10.30 A.M.	—	30,080
Jan. 30.....	—	—	—
Jan. 31.....	—	—	—
Feb. 1......	—	2,000,000	—

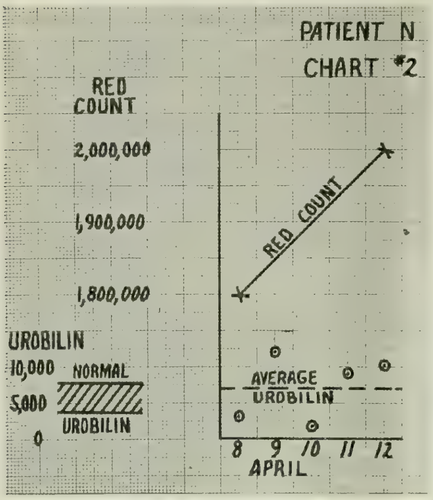
Average urobilin 34,187



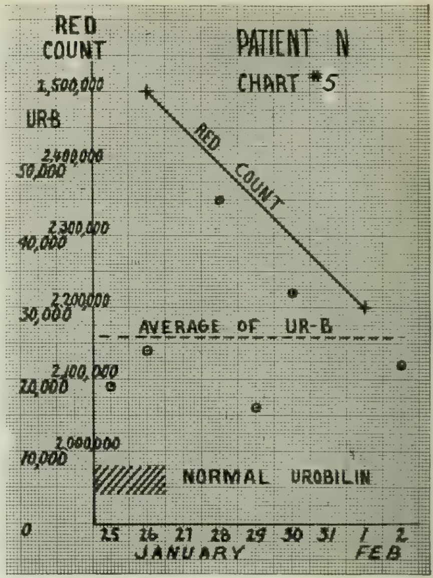
Urobilin excretion low; red count rising.



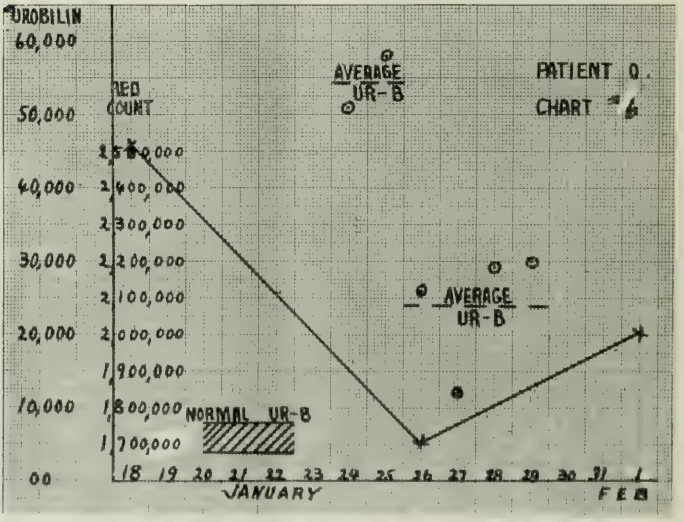
Urobilin excretion high; red count falling.



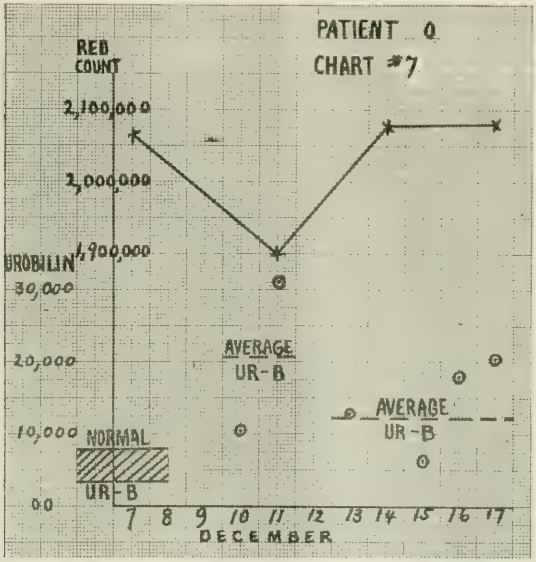
Urobilin excretion low; red count rising.



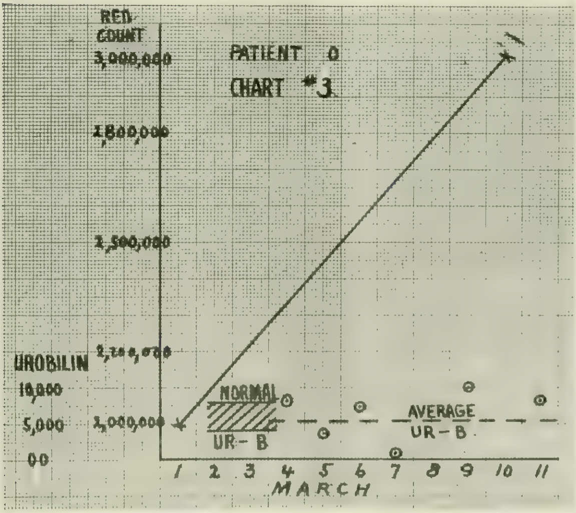
Urobilin excretion high; red count falling.



Urobilin excretion at first high, later lower, red count at first falling, later rising.



Urobilin excretion at first high, later lower; red count at first falling, later rising.



Urobilin excretion low; red count rising.

TABLE VII. PATIENT O.

UROBILIN EXCRETION AT FIRST HIGH, LATER LOWER; RED COUNT AT FIRST FALLING, LATER RISING.

DATE	TIME OF STOOLS	RED COUNT	UROBILIN
Dec. 7......	—	2,064,000	—
Dec. 8......	—	—	—
Dec. 9......	—	—	—
Dec. 10-11..	3.45 P.M.	—	10,240
Dec. 11-12..	5.45 A.M.	1,912,000	31,160
Dec. 12-13..	none	—	—
Dec. 13-14..	6.45 A.M.	—	12,800
Dec. 14-15..	none	2,080,000	—
Dec. 15-16..	4.30 P.M.	—	6,400
Dec. 16-17..	4.30 P.M.	—	17,920
Dec. 17-18..	4.30 P.M.	2,080,000	20,480
Average urobilin			16,500

It is clear from the charts how much more information regarding the hemoglobin metabolism determination of the urobilin excretion gives than blood examination. A red blood count or hemoglobin determination shows the condition of the blood only at the time of observation, but it does not show the cause of the anemia, nor does it show whether the patient is improving or retrograding. A urobilin estimation, on the other hand, shows whether the anemia is due to decreased formation or to increased destruction of the blood cells; and it shows, in addition, whether, and to what extent, the condition of the patient is improving or retrograding. The one is a "snapshot" of the status at any one time; the other is a "moving picture" showing the direction in which the disease is going.

REFERENCES.

[1] The literature on the subject is well reviewed in the following papers:
- *a.* Moffitt, H.: Studies in Pernicious Anemia. Amer. Jour. of Medical Science, 1914, N. S. 148, 817.
- *b.* Eliot, C., and Kanavel, A.: Splenectomy for Hemolytic Icterus. Surgery, Gynecology and Obstetrcs, 1916, 21, 21.
- *c.* Krumbhaar, E.: The History of Extirpation of the Spleen. New York Med. Jour., 1915, Feb. 6.
- *d.* Krumbhaar, E.: A Classification and Analysis of Clinical Types of Splenomegaly Accompanied by Anemia. Amer. Jour. of Med. Science, 1915, 150, 227.
- *e.* Krumbhaar, E.: Late Results of Splenectomy in Pernicious Anemia. Paper read before the joint meeting of the Section on Practice of Medicine and Section on Surgery, General and Abdominal, at the 67th Annual Session of the American Medical Association, Detroit, June, 1916.

[2] Eppinger, H.: Zur Pathologie der Milzfunktion. Berl. klin. Wochenschr., 1913, 50, 1509 und 2409.

[3] Decastello, A. von: Über den Einfluss der Milzextirpation auf die perniziöze Anämie. Deutsch. med. Wochenschr., 1914, 40, 689 und 692.

[4] Klemperer and Hirschfeld: Milzextirpation zur Behandlung der perniziösen Anämie. Therap. der Gegenwart., 1913, N.F. 15, 385.

[5] Goodman, E.: Über das Einfluss der Nahrung auf die Ausscheidung von Gallensäuren und Cholesterin durch den Galle. Hofmeister's Beiträge, 1907, 9, 91.

[6] Whipple, G., and Hooper, C.: Bile Pigment Metabolism.
- II. Bile Pigment Output Influenced by Diet. Amer. Jour. of Physiol., 1916, xl, 349.
- VI. Bile Pigment Output Influenced by the Eck Fistula. Amer. Jour. of Physiol., 1917, xliii, 544.
- VII. Bile Pigment Output Influenced by Hemoglobin Injections, Anemia and Blood Regeneration. Amer. Jour. of Physiol., 1917, xliii, 258.
- VIII. Bile Pigment Output Influenced by Hemoglobin Injection, Splenectomy, and Anemia. Amer. Jour. of Physiol., 1917, xliii, 275.
- IX. Bile Pigment Output Influenced by Hemoglobin Injection in the Combined Eck-fistula Dog. Amer. Jour. of Physiol., 1917, xliii, 290.

[7] Wilbur, L., and Addis, T.: Urobilin: Its Clinical Significance. Archives of Internal Medicine, 1914, 13, 285.

PULMONARY PUZZLES.*

BY JOHN B. HAWES, 2D, M.D., BOSTON.

I HAVE used this title, "Pulmonary Puzzles," to describe a group of cases that has been very frequent during the past year and that has been a source of great difficulty to me and to other physicians in Massachusetts, not only in diagnosis but also in treatment and disposal. There is an old play entitled "The Importance of Being Ernest." I might well paraphrase this and use as my text in this article "The Importance of Being Right," in solving these pulmonary puzzles.

Massachusetts is very wide awake to its tuberculosis problem. We have nearly enough beds in hospitals and sanatoria and will have enough when our county hospitals, now in process of construction, are completed; we have dispensaries in every town or city of 10,000 inhabitants or over; we have anti-tuberculosis associations and leagues and many nurses devoting all or nearly all their time to tuberculosis work. But in Massachusetts and elsewhere, we lack one thing, and that is a very big and important thing. We lack anything that approaches adequate instruction in the diagnosis and treatment of tuberculosis for the students in our medical schools.† The result is that every year we are giving the degree of doctor of medicine to many young men who have not only no idea of what our tuberculosis problem really amounts to, and the methods of solving it, but also little or no ability to diagnose incipient pulmonary tuberculosis nor to treat it when diagnosed. It very naturally follows that in spite of the really fine anti-tuberculosis machine that we have built up in Massachusetts, we are not getting the results that we should. Far too many wrong diagnoses are made; far too many cases are not diagnosed until the early and favorable stages are passed, and far too many patients are called consumptives who are really suffering from something else. It is this latter group that furnishes the "pulmonary puzzles" referred to in my title, and to which I wish to call attention in this article.

There are many physicians who believe that no harm is done in diagnosing a case as consumption even if it turns out to be something else. The treatment is rest, fresh air, and good food, and this can surely do no harm. Their motto seems to be "When in doubt, call it tuberculosis." True, this attitude does far less harm than the reverse—inability or unwillingness to diagnose tuberculosis—but it certainly does harm none the less. Richard Cabot believes in "truth in medicine"; so do I, and so I hope do all of us, but I also believe in being as certain as it is possible to be that what I tell my patients is the truth.

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* Read at a meeting of the Hartford Medical Society, Hartford, Conn., Oct. 15, 1917.

† At Tufts Medical School, under Dr. E. O. Otis, there is an excellent course on the subject.—J. B. H.

During the past year in Massachusetts and, I presume, elsewhere, there has been what has almost amounted to an epidemic of what I have called, for lack of a better name, "acute and subacute pulmonary infections." In children many of these are undoubtedly cases of bronchopneumonia; in adults I am frankly in ignorance of their exact pathology. In many ways they resemble cases of early tuberculosis and are often diagnosed as such. I have found such infections more frequently in young adults and generally ones who for some reason or another were run down and physically below par at the time. The present war, with its attendant mental unrest, worry, and physical overwork, has been an evident factor in numerous instances. There is usually a history of a protracted cold that refuses to clear up. In many cases this is the reason for seeking medical advice, while in others weakness, malaise, loss of weight and strength, fever and other constitutional disturbances are what cause the patient to seek an examination.

The history, as far as tuberculosis is concerned, is usually negative; indeed, I have found such infections in persons remarkably healthy and strong up to a few weeks previous to the onset of symptoms. There is apt to be little or no fever and, of particular importance, the pulse usually ranges low. This is a most important point in distinguishing these cases from tuberculosis.

The sputum, which should always be examined with care, is not characteristic. Influenza bacilli may be present, but usually there is a mixture of organisms chiefly strepto- and pneumococci. Blood and urine show nothing and the blood pressure is rarely depressed as is apt to be the case in pulmonary tuberculosis.

Pathological signs in the lungs are usually found at the bases. Occasionally only the apices are involved. Dullness and râles and rarely friction rubs are found in these cases. Changes in voice and breath sounds are uncommon. I have noticed one point I believe to be of value in differential diagnosis—namely, that the extent of the signs in the lungs is quite out of proportion to the subjective symptoms; an acute process of similar extent due to tuberculosis would, in the vast majority of cases, cause marked and striking symptoms. A few type cases are as follows:

Case 1. I. G., a very strong and athletic man of 41, with an excellent family and past history, came to see me with a history of having "felt mean" for one week, with slight pain in one side of his chest. I found a normal temperature and pulse, with a slight friction rub at one base. He stayed in bed for a week, after which he entirely recovered his health and the signs in his lungs disappeared. There has been no recurrence.

This was evidently an idiopathic dry pleurisy. There are many who consider all such pleurisies, wet or dry, to be tuberculous. Personally I do not hold this view, nor do I believe this man had or has tuberculosis. At all events, I never dreamed of reporting it as such, and subsequent events have justified my course.

Case 2. J. A., a woman of 40, came to see me early in May, 1917, because she had been told that she had consumption. One aunt had died of tuberculosis; she, herself, had been delicate as a child, with frequent attacks of bronchitis. She had had pneumonia in January, 1916. She gave a history of a bad bronchitis in August, 1916, since when she had felt poorly, with loss of weight and strength, with some cough and sputum, occasional fever, rapid pulse, and other suspicious symptoms. I found a normal temperature and pulse. She did not look sick. There was a violently harassing cough. In the lungs there were sticky râles all over. Temperature and pulse taken at home four times daily were normal, the pulse ranging from 70-75. Sputum showed bacilli of influenza, but none of tuberculosis. The râles, on my second examination, after taking iodide of potassium, were less numerous. I sent her away for two months, and examined her again recently and found her in excellent condition, with lungs normal.

Perhaps this woman has tuberculosis, but I doubt it. On my first examination there was enough evidence on which to make a positive diagnosis of incipient tuberculosis *providing* the patient could not be kept under close observation and examined more than once. Under the circumstances, however, I do not consider that the original diagnosis of pulmonary tuberculosis was justified.

Case 3. C. H. N. This man, aged 23 years, consulted me July 2, 1917. Family and previous history were excellent. Last May he came down with grippe. He had been working overtime in a munition factory and was tired out and underweight. After watching him for a few weeks, his local doctor told him he had tuberculosis, and reported his case to the local board of health. Another physician sent him to me. I found a temperature of 99, slight anemia and very little else. I could find nothing abnormal in the lungs. Sputum was negative. Temperature taken at home for four days was normal, and the pulse ranged from 60 to 70, and on reëxamination the lungs were again negative. Last week I saw him once more after a three months' interval, during which time he had been working hard, and found him absolutely well in every respect.

Was this tuberculosis and was the first physician justified in calling and reporting it as such, providing the sputum was negative? I should say no, emphatically, to each question. Was any harm done by so doing? In view of the fact that his life has been made miserable, and his wife upset by neighbors who have heard that he has consumption, and that a nurse and other inspectors from the Board of Health still call on him, I should say yes.

In this case, according to information received since writing, my diagnosis, despite my negative findings, was wrong. The physician who made the original diagnosis of consumption called me up and said that the sputum had been found *positive* by the house officer in the local hospital to which he had sent a specimen for examination. This was a month before I saw the patient. Although frankly inclined to doubt this finding of tubercle bacilli, it naturally modifies my course of action in this instance and tends to make me still more conservative and careful in handling future cases of this type.

CASE 4. A. C. This woman, a stout Jewess of 38, came to see me October 1, 1917, having been pronounced tuberculous at the out-patient department of a large Boston hospital. On examination preparatory to some operation, her lungs had been found to be "weak." The case had been reported to the local board of health as one of consumption. The family and past history was negative. She had a slight cough with some sputum, and was easily tired and out of breath. The temperature was normal, pulse 112, and weight 196½. There were scattered râles over the tops of both lungs, but no dulness or other abnormalities. The sputum consisted of clear mucus and, as I expected, contained no tubercle bacilli. On my second examination, after giving her hydriodic acid and free purgation, the râles were less evident.

I can hardly imagine why this case was ever diagnosed as tuberculosis. The only possible reason I can see is that the râles were at the apices and not at the bases of the lungs, and this is certainly very slim evidence on which to diagnose consumption.

Such cases as these could be endlessly multiplied; in Massachusetts, at least, this problem they present is becoming a somewhat acute one. Of course, looking at it from one point of view, it is distinctly encouraging that such errors as these are made because it demonstrates that the doctors are alive to the presence of tuberculosis and the need of its early diagnosis. The difficulty is, of course, that we have no definite set standards as to what constitutes pulmonary tuberculosis with absence of a positive sputum. To fill this need and for the benefit of the physicians engaged on the three years' tuberculosis demonstration at Framingham, I was asked to prepare, for a committee appointed to do this, a set of definitions on which certain diagnostic standards might be based. These definitions and standards are as follows. Doubtless every physician will wish to modify them, as I have already done, to fit in with his own individual opinions.

DIAGNOSTIC STANDARDS.

1. *Loss of Weight.* By "loss of weight" should be understood any unexplained loss of at least 5% below normal limits for that particular individual within four months' time.

2. *Loss of Strength.* By "loss of strength," in its pathological sense, is meant undue fatigue and a lack of staying power, which are unusual for the individual patient and which cannot be satisfactorily explained.

3. *Fever.* An occasional temperature of 99 should not be considered "fever." A temperature which persistently runs over 99 when taken at least four times a day over a period of one week (by mouth five minutes) should be considered of significance and to constitute "fever."

4. *Elevation of Pulse.* When the average normal pulse of the patient is already known, an elevation of 15 beats per minute, when the pulse is taken quietly at home during various periods of the day, should be considered abnormal. In cases where the average pulse is not known—and of course this constitutes the majority of cases—one should consider an average pulse of 85 or over in men, and 90 or over in women, to be abnormal. The combination of a subnormal temperature and an elevated pulse, as defined here, should be considered of great importance.

5. *Hemorrhage.* Any amount of expectorated blood, with or without sputum, requires medical investigation as to its source. Blood streaks, blood spots, etc., may or may not mean tuberculosis. On the other hand, a hemorrhage of one or two teaspoonfuls is presumptive evidence of the disease.

6. *Family History.* An occasional case of tuberculosis in the patient's uncles, aunts, cousins, etc., should not be considered of importance. It is an important fact when the patient's immediate relatives, such as brothers, sisters, father, mother, or grandparents have been tuberculous.

7. *Exposure.* Childhood exposure is of the greatest importance. Moderate exposure among normal, healthy adults of cleanly habits, is of less importance. Of course, prolonged contact with unhygienic habits or surroundings may be a dangerous factor at any age.

8. *Cough.* There is no cough characteristic of tuberculosis. Every cough that persists for six weeks or over requires investigation. Tuberculosis may exist without any cough whatsoever.

9. *Sputum.* The presence of sputum is not necessary for a positive diagnosis. Constant sputum, with or without cough, requires investigation. Absence of bacilli in the sputum after one or several laboratory examinations is not necessarily proof against the presence of tuberculosis.

10. *Hoarseness.* Any hoarseness or a persistent "huskiness" requires investigation.

On a basis of these definitions the following minimum standards in the diagnosis of pulmonary tuberculosis have been formulated:

1. When constitutional signs and symptoms and definite past history are absent or nearly so, there should be demanded definite signs in the lungs including persistent râles at one or both apices. By "persistent" it is meant that the râles must be present after cough at two or more examinations, the patient having been under observation for at least one month.

2. In the presence of constitutional signs and

symptoms, such as loss of weight and strength, etc., as defined above, there should be demanded some abnormality in the lungs, but not necessarily râles.

3. Usually a process at the apices should be considered tuberculous and a process at the base to be non-tuberculous until the contrary is proved, excepting when a clear history of pleurisy is present.

4. A hemorrhage, as defined above, is evidence of active pulmonary tuberculosis until the contrary is proved.

5. One should consider a typical pleurisy with effusion as presumptive evidence of tuberculosis. One should also consider a dry pleurisy evidence of slight tuberculosis.

6. Pain in chest and shoulders, night sweats, digestive disorders, etc., may be present, and should be investigated.

7. In every doubtful case one should demand that the patient be kept under observation for at least one month, with repeated sputum examinations, before a definite diagnosis is made.

8. Thoroughness and common sense on the part of the physician are the fundamental factors in the diagnosis of early pulmonary tuberculosis. Were they in more frequent use, the "pulmonary puzzles" of which I have spoken, and the "pulmonary tragedies" to which I have only referred, would be less frequent.

THE DIAGNOSTIC IMPORTANCE OF RECOGNIZING THE ABSENCE OF THE EPILEPTIC MAKE-UP IN STATES SIMULATING IDIOPATHIC EPILEPSY.

By L. Pierce Clark, M.D., New York City,
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If it be true that in essential or idiopathic epilepsy there is a more or less definite make-up, a character type of supersensitiveness, egotism, poor adaptability, and a certain defect in the power for development of the emotional life as contrasted with the intellectual equipment *per se*, then we should expect the absence of these stigmas of personality and character in a beginning case of supposed epilepsy should make us hesitate before finally committing ourselves to a diagnosis and prognosis which the nature of essential epilepsy entails.

I believe that more careful inquiry into the mental make-up in suspected cases of epilepsy will materially aid us in avoiding mistakes in future diagnoses. As a contribution to this end, I shall cite briefly three cases in which the consideration of this rule was of signal value to me.

Case 1 is that of a single man of 36 years of age, who was referred to me two years ago for diagnosis and treatment of a supposed epilepsy. The family history was unimportant. His own personal history in childhood was also unimportant, aside from a single episode which he had when suffering from a septic fever resulting from vaccination. He had an apparently inherited tendency to migraine, as shown in periodic sick headaches, which were common in several members of the family. His mother had suffered from sick headaches all her life, and at her death, three years ago, our patient ceased having sick headaches as such, which had been accompanied by nausea, vomiting, "black spots before the eyes" and classic fortification spectra, followed by short periods of extraphysical prostration. He then began to suffer at definite periods of a few weeks' interval with intensive frontal headaches, which seemed to replace the former migrainous episodes. Attending or following these headaches, he had dizzy spells, apparently lost consciousness, and had a sort of convulsion followed by apparent automatic motor restlessness, that is, he threw himself about the bed, was resistive to a mild degree, and muttered unintelligible phrases. In the coma of ten minutes following these episodes, he would pass into a deep sleep, followed by amnesia of the whole event on waking. The attacks always occurred at night, and usually after the patient had been asleep for an hour or more. After personally witnessing some of the sequelae of these attacks, his family physician concluded that, in spite of the absence of tongue-biting and voiding, the episodes were probably epileptic in character, and were replacement symptoms for the migrainous attacks from which the patient had formerly suffered. He was then given a thorough bromide sedation, and was placed on a dietetic and hygienic regimen such as is generally outlined for the epileptic state. This line of treatment proving of no real value, the case was referred to me. These peculiar attacks at the time he reported to me had increased in frequency to once a week or every ten days.

In an examination of the emotional life, it was found our patient did not possess the essential make-up of an epileptic. While the make-up was infantile in the extreme, and he exhibited little emotional reaction on going over his relations with the mother, nevertheless, taking into consideration that the migrainous episodes had undergone such a decided change at the mother's death, the closeness of his childish attachment to the mother, and his engrossment in memories of her since her death, psychoanalysis was recommended, both for therapeutic as well as diagnostic reasons, it being recognized that ordinary idiopathic epilepsy is not, strictly speaking, capable of psychoanalysis. A short course of investigation by the latter method was undertaken, and almost at once the whole underlying psychogenic nature of the disorder was laid bare, with the result that our patient has had no convulsive attacks since, now a period of two years. Strange to relate, he has not had a single migrainous episode since.

While it is not safe, of course, to withhold a diagnosis of essential epilepsy in the absence of clonic spasm, tongue-biting or voiding, and the other classic symptoms of an epileptic fit, yet their absence, as well as the failure of mental stigma of the epileptic character such as we have grown to expect to find in classic idiopathic epileptics, should make us hesitate in diagnosing essential epilepsy lacking these symptoms. Probably such cases as the foregoing are not common, but even though a few such are detected and cured, the degree of attention required for their delimitation from ordinary epilepsy makes the effort worth while.

Case 2, while not so conclusively psychogenic in causation, has special features worthy of attention. It is that of a married woman of 33 years of age, whose family history was negative aside from the presence of three or four convulsions in the maternal grandmother at 55 years of age, which continued until her death at 59; the exact nature of these attacks was not made clear. Our patient had five convulsions in all, apparently *grand mal* in type, one of which was attended by tongue-biting, but without voiding. The attacks spread over a period of two years. In the last episode of attacks, a year ago, she had three in one night. An ordinary general physical examination disclosed nothing to cause the attacks. She was then referred to me as a case of epilepsy. The complete absence of an epileptic make-up was not so clear in this case as in the first one just given, as our patient's emotional life had been rather rigid in its evolution. At her father's death she had continued such a close attachment to the mother that it had been difficult for her to make a good adult marriage. She had periods of extreme sensitiveness to all sorts of physical adaptations in the new married life. She worried a good deal about a number of apparently trivial things, such as the summer heat, the position of her bed, and certain articles of clothing. Soon after these irritabilities became marked, she lost weight and would seem to long for her mother and her old home surroundings. As just stated, there was evidently a very considerable difficulty in physically and emotionally adapting to the married state. However, while this state of irritation and adaptive stress was present, the attacks did not appear until a true and severe chlorosis occurred. There was thus an intense coincidence of the mental maladjustment plus the anemia. Undoubtedly, the two causes were sufficient to precipitate an attack in one hereditarily predisposed and in one who possessed a supersensitive make-up. Since a series of psychotherapeutic talks, plus the overcoming of the chlorosis, her life is running smoothly again and she is in excellent physical health. An important point in the case was the masked anemia. If a routine blood examination had not been made at one of these recrudescent periods, the chlorosis and its attendant evil effects probably would not have been detected. The blood test at first showed: hemoglobin, 65%; red blood cells, 5,080,000; lymphocytic differential count, 41%. The examination as a whole showed no poikilocytosis, but that of a definite chlorotic true anemia. After a period of two months' treatment the test showed: hemoglobin, 90%; red blood cells, 5,180,000; lymphocytic differential count, 22%. The whole blood picture approximately was that of the normal with little variation in size and shape of the red blood cells.

Case 3 is that of an apparently strong, healthy boy of nineteen years. For several years he had been listless, dull, and lacked concentration. He was not of a robust make-up, and his endurance was poor. While he was poor in mathematics and was backward in all his studies, psychometric performance tests showed he was not feeble-minded. He was classed as incurably lazy by his teachers. For two or three years he had had an almost uniformly bored manner, broken a few times by short periods of boyish enthusiasm, which quickly disappeared. On the whole, the make-up was a rather colorless and indifferent character, which seemed to have no special bent or inclination. Judgment, memory and process of thought were normal.

With a history of this affectless make-up of dementia precox type, there was a history of several classic *grand mal* epileptic attacks. His whole manner of living at home was dispiriting, ambitionless and totally devoid of proper mental hygiene. Simply removing the environmental stresses did not remove the attacks. Not until he was regularly adjusted in a congenial farm environment, with definite duties and privileges and receiving compensation for his work, did the attacks cease. In this new environment he also corrected much of his deterioration of habits.

The case well illustrates a certain type of mild dilapidation of the dementia precox type in which epileptiform attacks not infrequently occur. In the absence of the greater part of the epileptic make-up the relatives were given a fairly good prognosis as far as the epilepsy was concerned, if the life issues could be brought under proper control. The fact that the boy mended at once with a good healthful, common-sense system of living, shows that the tendency to epileptic reactions was not very severe.

One is rather impressed that not a few such cases of mild habit deterioration disorders of adolescence, with occasional epileptiform episodes, occur and that, however guarded the future prognosis of the mental states may be, one is rather safe in saying that the convulsive episodes in such are not true epilepsy with its much more hopeless prognosis.

To summarize: Case 1 is a psychoneurotic disorder with psycholeptic crises apparently cured by psychoanalysis. Case 2 with a partly epileptic make-up and inheritance in which the life adaptation forces of adult life plus a chlorosis engendered a physical and mental stress that brought about convulsive attacks of an epileptiform nature. Given psychotherapy, in which psychoanalytic principles were brought in as aid, plus proper treatment for the anemia, the condition seems to have been brought to an arrest. Case 3 was that of a young man of an inferior and affectless make-up similar to that of the precox type, who had epileptiform attacks under a poorly adjusted environment and home training. By substituting a good common-sense healthy régime, this young man appears to have lived a fairly healthy life without seizures for the past two years.

THE USE OF THE HEMOSTAT IN TONSIL OPERATION.

By Joseph Prenn, M.D., Boston.

The prime object of operative technic is to bring the operation to a point of safety.

This short paper does not claim any new discovery of method; it simply tends to introduce and emphasize in this field of operation the mechanical device of checking bleeding from a vessel, namely, the hemostat, universally used in other operative fields. In the latter, when a vessel is cut, be it an artery or vein, the operator deems it imperative to clamp the same, to get a clear operative field and to prevent the so-called secondary hemorrhage. He would not take any chances, saying that it will stop by itself, for it might, and it might not.

That tonsillectomy is the operation of choice when a tonsil operation is to be performed, the profession is fairly well convinced; that it is a neater and more elegant operation, everybody will agree; and this involves the question of bleeding. In tonsillotomy there is a gush of blood immediately following the operation, because we cut into a large area of mucous membrane of the tonsil, which is very vascular. Barring hemophilics, this ought not to cause any anxiety. The palato glossus and palato pharyngeus muscles, by their active contractions around the tonsil, will also help in checking the bleeding. In tonsillectomy we do not cut into the mucous membrane of the tonsil. We go behind its capsule. Instead, however, we sever the blood vessels that go to form the blood supply of the tonsil directly. When the tonsil did not undergo many inflammatory changes, there are comparatively few and very small vessels that are cut during the process of enucleation. So long as we work on this side of the superior constrictor muscle (and we always do in tonsil operations) we are safe. The constriction of the same by the snare and the active contractions and natural tonus of the superior constrictor muscles through which these vessels go, serve as a hemostat, and as a result we have very little bleeding, or, as some wish to call it, "a bloodless operation." It is different, however, when there were many previous inflammations, peritonsillar abscesses; when during the process of repair, new and larger vessels were formed, which do not always close up immediately by the above-mentioned means. In such a case, the actual loss of blood, as far as the patient is concerned, is not any less, and sometimes more than in tonsillectomy operations (though one may console himself that this occurs after the tonsil has already been removed), unless some means are employed to reduce the bleeding to a minimum.

That we are cutting blood vessels between the capsule and tonsillar walls is a fact that cannot be questioned. Whether the principal vessel is the tonsillar artery from the facial or also branches from the dorsalis linguae, ascending palatine branches, or, as some would have it, that two arteries, the ascending palatine branch of the facial and the descending palatine of the internal maxillary, from which by anastomosis outside the fossa a single artery is formed that makes up the blood supply of the tonsil, the fact remains the same.

Where do we get most of the bleeding points? After enucleation the tonsillar fossa is all covered with blood, but on sponging it out we can see the bleeding points or the severance of the vessels at the superior portion and sometimes also at the base of the tonsil. On clamping the same by the hemostat, the whole field becomes clear. If there is quite an active flow, leave the hemostat in place while doing the other tonsil or the adenoids. The writer once encountered a real spurter, and the hemostat in that case was sufficient to check it. Outside, then, of the fact that there is much less blood lost by using the hemostat after enucleation, there is also a greater sense of security on leaving the patient.

Dr. Israel in the *Laryngoscope* of February, 1917, describes a suction apparatus to maintain a dry field and to lessen the occurrence of postoperative pneumonia in tonsil operation. In the writer's opinion, though the apparatus can be used to advantage, the changing of the position of the head forward during operation, the quick sponging, and the hemostat, will obviate this inconvenience and danger.

Book Reviews.

Studies from the Rockefeller Institute for Medical Research. Vol. 25. New York. 1916.

This volume consists of a series of 35 papers by members of the Rockefeller Institute, reprinted from various sources. Particular attention may be directed to the work of Stoddard and Cutler on "Torula Infection in Man"; of Jones on a "Transplantable Carcinoma of the Guinea Pig"; of Pearce and Brown on "Renal Injury and Repair"; and of Ingebrightsen on the "Biology of Peripheral Nerves in Transplantation." Rous, Turner and Jones continue their studies of the "Preservation of Living Cells in Vitro" and the "Protection of Pathogenic Microörganisms by Living Cells." Flexner and Amoss report their results in the "Chemical versus Serum Treatment of Epidemic Meningitis"; Louve and Wasteneys present a second communication on the "Efficiency of the Spectrum for the Heliotropic Reactions of Animals and Plants"; and Theobald Smith records a description of "Certain Aberrant Intestinal Protozoan Parasites in the Turkey."

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ALCOHOL AND HUMAN METABOLISM.

No one now doubts the value of alcohol in medicine, and its loss would be almost irreparable. In health, however, there is just as little doubt that alcohol is a luxury and unnecessary for the maintenance of the normal physiologic balance. On the other hand, just as with many other luxuries, it is difficult to demonstrate any tangible harm from the consumption of moderate amounts, except as such small amounts may stimulate the desire for later excessive indulgence. Small amounts of alcohol often give greater poise to the individual, lessen fatigue, and make recovery therefrom somewhat more rapid. On the other hand, nearly all life tables compiled by assurance organizations seem to point to a longer life to the total abstainer. There is, however, as much logic with those who maintain that moderation in alcohol has an indifferent effect. When we come to the all-too-prevalent immoderate use of alcohol, we find that it contributes a very great share to the incidence of human suffering and depravity. It lowers the scale of the stock and causes much of the mental, physical and moral degeneracy. Even without actual boisterous or paralytic intoxication, the immoderate use of alcohol destroys the judgment, shortens the memory and generally disorients the user. In spite of popular notions to the contrary, alcohol is the destroyer of the morale and the morals, rather than the strengthener. It is never fair or wise to trust to immoderate drinkers, or to those who never do without some alcohol, the lives, the welfare, the efficiency of individuals, or the operation of delicate or high-powered machinery. Many railroads are making total abstinence a *sine qua non* of employment. Immoderate users of alcohol are more sensitive to the cravings for alcohol than to the needs or the responsibilities of their particular callings.

The question of the food value of alcohol, and whether it can take the place of real food, is just as much the subject of controversy as the general effects of its use. Only a comparatively small quantity of alcohol can be utilized by the body over long periods without causing tissue changes, especially in the nervous and cardiovascular organs. Of the alcohol taken into the body, nearly all but 5% is consumed. Alcohol is a real food in so much as being consumed in the body it releases energy; and it is an economical food because so much of it undergoes combustion and so little is waste. It would seem to be an especially valuable food because it is so easily diffused and so highly assimilable. When an insufficient amount of carbohydrate or fat is fed to the organism, the protein of the body may be subsidized to overcome this deficiency. When this subsidization actually occurs it is manifested by the increase in the nitrogen elimination derived from the body protein thus utilized. That alcohol may take the place of these foods and conserve food generally, as well as act as a tissue builder, has often been demonstrated by Nauman's experiments in metabolism with the substitution of alcohol for food. The reduction in the fat-food administered and the substitution of alcohol would reduce the elimination of nitrogen when persisted in for a few days, showing, at least, that the protein was not drawn on because of the lack of fat-food. When the normal amount of fat-food was given in addition to alcohol, the nitrogen elimination fell still lower, and rose when the alcohol was then eliminated. It rose still higher when the fat-food, as well as the alcohol, was removed. It follows from these experiments that alcohol can take the place of a chemically equivalent amount of fat-food, and that it causes an economy of the proteins just as do fats and carbohydrates. Of course, this economy cannot be practised in the human body for any considerable period because of the profound narcotic and tissue changes and degenerations that would occur if such economy were forced. On the other hand, intemperance so often is accompanied by malnutrition that it seems that there is a limit of tolerance above which alcohol will fail even as a food conservator.

While the question of strong alcohols may be disposed of on the grounds mentioned, it is not so easy to dispose of the question of the place of the lighter alcoholic beverages, particularly beer. It must be remembered that beer forms a large part of the dietary of workers, and it is not at all unlikely that the affinity for this beverage lies in its protein-saving qualities among a class who may be otherwise protein underfed. Moreover, it has been demonstrated (*Hygienic Laboratory Bulletin*, Feb. 18, 1916) that beer contains a very large amount of vitamine substance. Brewing materials, such as brewer's yeast, have even been used in the treatment of conditions thought to be due to a lack of vitamine feeding. At any rate, when foods containing much vitamine, such as meat, milk, eggs, etc., are high priced, the demand for beverages containing it can easily be understood—and more so, when, because of food conditions existing at present, food shortage is likely to aggravate high prices.

* * *

UNTOWARD SURGICAL COMPLICATIONS.

Newer surgical technic, aseptic precautions, and proper after-care have reduced the risks from the direct effects of surgical operations a great deal, nevertheless there is left a large element of untoward surgical danger that is not affected by these elements, that cannot be foreseen in advance, and for which treatment is not always very satisfactory. The most common and the most serious of these complications are paralytic ileus, thrombo-phlebitis and parotitis. Any of these complications may arise after a comparatively simple operation or after labor, as in the case of thrombo-phlebitis. When a surgical operation must be undertaken to save life, these untoward complications have, of course, not the same embarrassment as when operation is undertaken for non-essential conditions. Much conservatism in surgery is dictated by the possibility of these complications. Although many theories have been advanced in explanation of these complications, none of them is quite satisfying.

While infection would seem to be the cause of the thrombo-phlebitic complication, yet it has been impossible, either clinically or experimentally, to demonstrate that infection is the sole cause. Nor has the theory that it is some endothelial damage or slowing of the blood current from intrinsic blood changes not connected with the operation, received any substantiation. It is not unlikely that, while no one condition can be said to be at the bottom of this particular complication, a great many combined elements, such as vessel wall changes, blood changes, mechanical irritants, proteins released in the course of the operation, and infective agents,—all contribute their part in the etiology of this troublesome and dangerous complication. It seems that operations on the blood vessels and the alimentary canal are most prone to cause this complication, about 2% of operations giving evidence of thrombotic involvement. About 70% of these are in the lungs, and about 10% of all these thrombotic complications terminate fatally.

Parotitis, while a rather infrequent untoward complication in operations on adults, is very common in children, especially after mastoid operations. The absence of inflammatory processes about the blood vessels of the parotid lobule is evidence that the infection does not arise through the blood vessels. It seems to be an ascending infection through Stenson's duct. On examination of the duct in the center of a lobule in the case of this kind of parotitis, it will be found choked with debris and pus. The dense parotid fascia confines the pus and prevents it from pointing early. However, incision should be made early down through this fascia, in order to prevent the danger of a pyemia. Altogether, this complication is the least untoward of all of them; since the prevention of injury to the parotid during anesthesia and the keeping of the teeth clean after operation will prevent a great many of these complications.

The most baffling, and what can be the most rapidly fatal of all, is paralytic ileus. The paralysis of the muscular coat allows distention, sometimes to enormous degrees. This complication is more nearly a complication extrinsic to the operation, but brought about by some constitutional inferiority of the nervous mechanism of the individual, either generally or localized in the nervous tissues controlling this region. Irritation of the splanchnic fibers which inhibit intestinal peristalsis is the most direct cause of this condition. According to McKenna, the paralytic condition is of nervous origin, caused either by disturbances in the anterior cornual cells and in the corresponding sympathetic ganglia, giving rise to the splanchnic fibers, or to disturbances taking place directly in the sympathetic plexuses of Auerbach, Meissner and Billroth, within the walls of the intestines. Undoubtedly these disturbances and the resultant complication will not take place except in individuals with sensitive or unstable nervous systems—in those who are so prone to disturbances of the vegetative nervous system. Individuals predisposed to disturbances of the nervous tissues mentioned, of the sympathetic system, are types conforming to the class known as sympathicotiacs; those in whom the vagus centers are more sensitive to change and disturbances are known as vagotoniacs. In so far as this last complication is concerned, it would be well to pay attention to the nervous constitution of prospective surgical cases not requiring urgent surgical intervention to save life, in order that such eventualities may be anticipated, at least in the marked cases.

MEDICAL NOTES.

Nourishment of New York School Children.—Dr. Henry Dwight Chapin, head of the children's division of the Post-Graduate Hospital, New York, made the statement in an address recently given, that 110,000 out of the 1,000,000 public and parochial school children in that city were undernourished and in need of attention. He believed that war prices were to be blamed for this condition.

New England Association of Physical Therapeutics.—A regular meeting of the New England Association of Physical Therapeutics was held at the Copley Square Hotel, Boston, on Tuesday evening, December 18, 1917. Dr. C. Hermann Bucholz, of Boston, director of the Medico-Mechanical and Hydrotherapeutic Departments of the Massachusetts General Hospital, author of the recent book on Exercise and Massage, gave a talk on that subject.

The election of officers for the ensuing year took place at this meeting, the nominations being: for president, Dr. Frank E. Stowell; for first vice-president, Dr. Samuel J. Harris; for second vice-president, Dr. Arthur H. Ring; for treasurer, Dr. Frank B. Granger; for secretary, Dr. Frederick H. Morse; Executive Council, Dr. Frank E. Goodell, Dr. Solon Abbott, Dr. William McFee.

Prospective Medical Meetings.—The American Climatological and Clinical Association will meet at the Boston Medical Library, June 5 and 6, 1918, under the presidency of Dr. J. H. Elliott, of Toronto. Immediately succeeding this meeting, the National Association for the Study and Prevention of Tuberculosis will hold its annual meeting.

Relief at Halifax.—The doctors and nurses who comprised the state guard unit have been relieved by the Rhode Island Red Cross Unit and have returned home. The Greater Boston Red Cross unit is operating a hospital at St. Mary's College and the Maine Red Cross unit is operating a hospital at the building of the Halifax Ladies' College. An emergency hospital in the Y. M. C. A. building for obstetrical cases is in charge of Dr. E. A. Codman of Boston. Dr. Mackenzie of the Massachusetts Eye and Ear Infirmary, who was one of the unit sent from that hospital to care for the many cases of eye injury, writes as follows regarding his experiences:

"Thirty-six hours without sleep, and my shoes not off, but nevertheless I must write what we were up against—one eye-man in Halifax to treat thousands of injured.

"Of the thousands hurt, approximately one-third are eye injuries and the physical disabilities of this catastrophe will be felt in the future more than those of any other in the history of the world, and for this reason. For a long time the people of Halifax have been constantly on guard against the possibilities of bombardment from the sea or by Zeppelins. (Even here in our hotel room is a big sign warning us to pull all window shades the minute the lights are started, and a penalty of $5000 is imposed upon those who refuse to do so.)

"Halifax has had the idea of an air attack and therefore when a rumbling was heard and vast clouds of dark smoke were seen last Thursday morning, thousands ran to their windows and looked up in the air. Then came the explosion, which shattered nearly every window right in their faces. So it is that at other hospitals and at the Victoria General, the Children's Hospital and the Blind Institute, where Dr. Goodall and I are working, more than a third of the cases are eye cuts.

"Dr. Mather, who sent for us, worked alone for three days, before we arrived, without even a wink of sleep. He did more than seventy-five enucleations and eviscerations—some of these in an operating room with the snow blowing in on the patient and himself. No wonder that we found him a physical wreck.

"I immediately took full responsibility, for he surely was no longer capable, and he wished me to. I went over, personally examining about 125 eye cases, in the Victoria General Hospital and sent Dr. Goodall with a Newton Hospital nurse, who came on the train with us, to look over the Children's and the Blind hospitals. We all worked incessantly for several hours, and then, after a few bites, began operating. When I had a chance to see Dr. Mather again, he agreed with me that there is need of fresh nurses, and particularly those capable of treating eye cases, many of which are exceedingly serious. We have begun to systematize things, and are gathering all the eye cases together, with the idea of saving time and energy for all concerned. Dr. Stevens came today and he and Dr. Crosby are looking after several of the smaller places.

"Halifax is a wreck. Even newspaper reports cannot truly portray conditions. Relief has come very promptly, and is coming every day. So there seems to be plenty to eat and plenty of ordinary supplies; and help in some lines is plentiful.

"This is hastily written, and with eyes half-closed. The chance to work here is surely the greatest opportunity we have had and our regret is that we couldn't have come sooner."

WAR NOTES.

DEATH OF MEDICAL RESERVE OFFICER.—Report is received from General Pershing of the death of First Lieutenant Edgar W. Young, Medical Reserve Corps, attached to British Forces in France. He had been severely wounded in action.

HEALTH OF GERMAN ARMY.—From Copenhagen comes a report of the health of the German Army, which states that the percentage of illness among both soldiers and sailors is steadily decreasing. In the Army the number of cases of illness is now about 20 per cent. lower than in the first year of war. For the Navy very complete reports are published, indicating that the number of cases of illness per 1000 men is about 25 per cent. lower than in peace time.

Diseases of the organs of nutrition furnish more patients in the naval hospitals than any other single cause, but it is stated that the number even of these cases shows a steady improvement, falling from 78 per 1000 men in peace times to 56. Tuberculosis shows a slight increase, but other diseases of the respiratory organs have decreased very largely. Nervous disease has decreased slightly, diphtheria has almost disappeared, scarlet fever shows a slight increase.

ENLISTMENT OF PHYSICIANS.—A recent number of *Leslie's Magazine* comments as follows upon the reluctance of medical men to enlist in the Medical Reserve Corps.

"The most surprising feature of our preparation for war is the apparent reluctance of young American physicians to volunteer for the Medical Officers' Reserve Corps. The War Department estimates a need of 21,000 men for hospital service.

Seventeen thousand five hundred physicians have been recommended for commissions, but up to Oct. 12, 1917, about 1200 of this number had declined to accept the commissions offered to them. Two hundred of those who were willing to go to the front had to be discharged because of physical disqualifications or for other reasons. Consequently there is a shortage of several thousand men in the Medical Reserve Corps.

Here is a curious situation. The Army offers physicians the right to wear the uniform of an officer, an opportunity to gain invaluable experience in the field hospitals and incomes larger than the average physician's earnings.

Fear of danger cannot enter into the problem. The total casualties among medical officers of the Allied armies on the Western front from the beginning of the war to June 25, 1917, were 195 killed, 707 wounded and 62 deaths from disease. These figures, compared with the number of physicians employed at the front, prove that the medical officers' work behind the trenches is scarcely more hazardous than the ordinary risks of civil life. Quite aside from the question of patriotism, it is impossible to understand why Medical Corps commissions are going begging."

REPORT OF THE NAVY.—Dr. Braisted in reporting the causes of death for the navy during the past year says deaths rose to 4.83 per 1000, against 4.48; but 36 of these deaths were men lost with the U. S. S. *Memphis* at Santo Domingo. Drowning took 74 lives during the year, including the men of the *Memphis;* tuberculosis, 39; pneumonia, 22; burns, 16; wounds, 13 (Haiti and Dominican campaigns), and nephritis, 13. For the second time in the history of the service there was no death from typhoid.

DEATHS AMONG U. S. TROOPS IN FRANCE.—General Pershing has reported deaths among United States troops in France from December 12th to 14th, inclusive, as follows: From pneumonia and its complications, five deaths; scarlet fever, one; accidents, three.

TUBERCULOSIS AMONG DRAFTED MEN.—In addressing a conference of dispensary nurses at the

State House, Health Commissioner Allan J. McLaughlin stated that more than 1000 cases of unsuspected tuberculosis were revealed in Massachusetts by the physical tests to which the selected men of the first draft quota were subjected.

HEALTH CONDITIONS IN ARMY CANTONMENTS.—The Surgeon-General's report for the week ending December 7th states that the measles epidemic in the camps of the 30th, 31st, 38th and 39th Divisions of the National Guard troops no longer constitutes a menace. Pneumonia following measles is particularly increased in the 36th Division and slightly increased in the 34th, 38th and 39th. All other National Guard camps show a decrease in measles, although there have been a number of cases of pneumonia independent of measles in all National Army and National Guard camps. The report shows 190 deaths during the week in the National Guard, of which 171 were from pneumonia and 74 deaths in the National Army, of which 47 were from pneumonia.

WAR RELIEF FUNDS.—On Dec. 20 the totals of the principal New England war and relief funds reached the following amounts:

Halifax Relief Fund	$579,484.38
French Wounded Fund	304,719.81
French Orphanage Fund	135,546.09
Cadet Engineers' Fund	6,481.40
War Dogs' Fund	2,265.28

NEW ENGLAND NOTES.

NASHUA MEDICAL SOCIETY.—The Nashua Medical Society at its December meeting on the eleventh instant listened to an illustrated talk on "Vasomotion and Blood Pressure" by Dr. George V. N. Dearborn of Boston, giving the results of some of his investigations in that promising direction.

BOSTON AND MASSACHUSETTS.

FIRST AID WORK IN INDUSTRIAL ESTABLISHMENTS. In the fourth annual report of the State Board of Labor and Industries appears the following note on the establishment of welfare and first aid departments in industrial plants. "There have been 1078 orders complied with by different establishments to install medical and surgical chests for the treatment of persons taken ill or injured on the premises. More than 300 establishments have organized 'welfare departments' under the supervision of either physicians and nurses, or nurses and foremen or forewomen."

The appointment of nurses to various industrial establishments not under medical supervision has given rise to considerable controversy because of the responsibility associated with such appointment. It is the general opinion that all nurses engaged in welfare work in industrial establishments should work under the direction of a physician, who should be held responsible for the treatment given and for the after-care of the injuries received.

NEW TUBERCULOSIS SANATORIUM.—Plans are being made for the erection of a new tuberculosis sanatorium at Rutland, Mass. It will be called the Crane Sanatorium and will be under the direction of Dr. Bayard T. Crane, with a medical staff which will include Dr. Walter C. Bailey, Dr. Vincent Y. Bowditch, Dr. Albert C. Getchell and Dr. Loring T. Swaim. The sanatorium is designed to care for cases of tuberculosis which occur among American troops, and when war is over it will become part of the colony of the present Rutland sanatoria and serve for the civil population. Funds of not less than $100,000 are needed to establish this sanatorium. Contributions or pledges may be sent to Leonard W. Cronkhite, treasurer, care of the Merchants National Bank, Boston.

The Massachusetts Medical Society.

NOTES FROM THE DISTRICT SOCIETIES.

DISTRICT CORRESPONDENTS.

Bristol North, ARTHUR R. CRANDELL, M.D., Taunton.
Berkshire, A. P. MERRILL, M.D., Pittsfield.
Bristol South, EDWIN D. GARDNER, M.D., New Bedford.
Essex North, T. N. STONE, M.D., Haverhill.
Essex South, H. P. BENNETT, M.D., Lynn.
Hampden, LAURENCE D. CHAPIN, M.D., Springfield.
Hampshire, E. E. THOMAS, M.D., Northampton.
Middlesex South, WILLIAM C. HANSON, M.D., Belmont.

MIDLESEX SOUTH DISTRICT MEDICAL SOCIETY.—We were permitted to hold a meeting at the Base Hospital, Camp Devens, Ayer, on Thursday, November 15, and were cordially received and entertained by members of the Hospital Staff. Addresses were given by Maj. Glenn L. Jones, M.C., Commanding Officer of the Hospital, and by Maj. William L. Cousins, M.R.C., Chief of Surgical Staff. After the meeting, opportunity was given the 200 members present to see the Hospital. The occasion was timely and exceedingly interesting.

The personnel of the Middlesex South District Committee, Council of National Defense, Medical Section, is as follows:

George T. Tuttle, Chairman, Waverley
William D. Swan, Cambridge
Charles C. Foster, Cambridge
George L. West, Newton Center
Henry S. Rowan, Brighton
Conrad Bell, Waltham
Thomas M. Durrell, Somerville
Charles E. Prior, Malden
Lewis M. Palmer, Framingham
William C. Hanson, Secretary, Belmont

Following is a list of physicians practising in the Middlesex South District who are in the military or naval service of the United States or the Allies*:

E. Stanley Abbott, Belmont
Carl E. Allison, Somerville
George A. Biondi, Framingham
William H. Blanchard, Allston
James T. Buckley, Marlborough
Harry C. Burrell, Medford
Patrick F. Butler, Allston
William R. Byrne, Framingham
Frederick B. M. Cady, Cambridge
Franklin E. Campbell, Medford
Willis E. Clarke, Malden
Thomas J. Courtney, Waltham
Eugene A. Darling, Cambridge
Ralph W. Dennen, Waltham
David C. Dow, Cambridge
Augustus W. Dudley, Cambridge
John E. Dwyer, Cambridge
William J. Dwyer, Cambridge
Irving W. Fraim, Waltham
Edward French, Brighton
Nicholas A. Gallagher, Malden
L. U. Gardner, Cambridge
James Glass, Framingham
William E. Hamlin, Waltham
Joseph S. Hart, Lincoln
George W. Holmes, Chestnut Hill
Frederick R. Ilsley, Medford
Leon W. Jessamon, Framingham
Fred R. Jouett, Cambridge
George F. Keenan, Brighton
Leo T. Kewer, Waverley
Allan S. Kirkwood, Newton Center
Frank C. Leavitt, Belmont
Roger I. Lee, Cambridge
Donald Macomber, West Newton
Clyde H. Merrill, Marlborough
Edwin A. Meserve, Watertown
Eugene J. McCarthy, Malden
Louis F. McCarthy, Malden
English N. McLaughlin, Newton
Frank L. Morse, Somerville
John J. Murphy, Cambridge
Walter Joseph Otis, Waverley
Albert S. Owen, Framingham
Albert Pfeiffer, Lexington
William B. Reid, Newton
J. Arnold Rockwell, Cambridge
Charles F. Sharry, Somerville
Horace P. Stevens, Cambridge
William W. Walcott, Natick
James J. Walsh, Lexington

(Signed) William C. Hanson,
District Correspondent.

Obituary.

RAMON GUITERAS, M.D.

Dr. Ramon Guiteras, known internationally as a surgeon and a sportsman, died in New York on December 13, of meningitis. Dr. Guiteras was born in 1859, and was a cousin of Dr. Juan Guiteras, well known for his work in yellow fever. Dr. Guiteras received his medical education at the Harvard Medical School. He had served on many advisory boards and was secretary for many years of the Pan-American Medical Congress. He was the author of two books on surgery and had made many trips to European battlefields in the interests of his specialty. He was at work on a third book when death overtook him. Dr. Guiteras was a member of the American Medical Association and a Fellow of the American College of Surgeons, besides many social organizations. He was a bachelor and had lived in New York for many years.

Correspondence.

A SUGGESTION.

State House, Boston, Dec. 11, 1917.

Mr. Editor:—

I have followed, with interest, the hearings, at the State House, of the Social Insurance Commission, and particularly those at which the medical men have taken part. I have been struck by their lack of enthusiasm over any particular advance in the way of legislation. As they are specialists, I have felt that if they, having at heart the health of the community, took this position, the Commission ought to go slow. My emotions have been varied.

I have heard an eminent practitioner, who appeared voluntarily and courteously, asked if he were there to protect the gate receipts of the profession, which he, perhaps with reason, resented. I have heard a leading member of the Massachusetts Medical Society, upon gentle interrogatory, with a rare economy of diction, decline to answer the most proper questions, and even challenge the Commission to separate him from an answer, and then tell one of its members how he might more closely approach his ideal.

The doctors and the commissioners seemed to fail to get together, or perhaps to threaten to get too closely together.

I have a great respect for the medical fraternity, and for their interest in conserving and raising the plane of the public health, and have no reason to suspect them of any unworthy motive or of any wish but to help the Commission.

I have been impressed by their failure to advocate any form of legislation. If they, as specialists, take this attitude, the Commission, with a proper respect for the result of their study, perhaps ought to go slow.

And yet, I should like to see progress made.

I know that it is easier to criticize than to frame a proposition.

For these reasons, I append a proposition which has been brought to my notice. It seems to me, unlike some other health propositions which look good to me, that this would not meet with that political opposition which too often discourages the study and prosecution of a good bill. A bill which is good but which cannot be passed into law has little value outside of the files of an office or library.

I submit this Free School Health suggestion because I should like to know, if it lacks strength, where it is weak, and, through the columns of this paper, perhaps this may best be done.

Yours truly,
R. M. Washburn

FREE SCHOOL HEALTH.

We believe that medical diagnosis, advice, medicine and surgery should be even more within the reach of the people than at present, and with less of a coloring of charity, which often humiliates and repels. We believe that medicine should, as much as possible, be kept out of politics, and that its rewards should be large enough to keep it on the highest and most efficient plane. We believe that legislation should be slow and safe, and that legislation for the young has a preventive strength, for the field, while narrow, strikes all the people. ....After the analogy of free text-books, we believe in further progress toward free health for all school pupils.

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* The Secretary will be glad to receive notice of errors and omissions in this list.

The present treatment of pupils in this State seems to lack completeness. It has not gone far enough. Methods vary with the locality, also the number of physicians and nurses per pupil, while all could use, it seems, more money.

We believe in developing this work with due regard to the principle of home rule, and, for the sake of uniformity, that it should be done under the supervision of both the local and state school boards and boards of health; and to eliminate opposition, the operation of the law should be made optional with the parent.

In order that the start may be made safe, and recognizing the undesirability of assuming the care of all troubles and the difficulty of discrimination, treatment should begin and stop, for the present, at medical diagnosis in all cases, and the medical and surgical care of the eyes, ears, noses, teeth and nervous systems of the pupils.

For simplicity, and because of lack of funds in some of the towns, the bills should be paid by the Commonwealth.

FURTHER CONCEPTS OF INSANITY.

Boston State Hospital, Psychopathic Dept.,
74 Fenwood Road, Boston, Dec. 16, 1917.

Mr. Editor:—

I have read with some interest the editorial on "A Broader Conception of Insanity," and believe there are certain points therein which might be further touched upon.

In the first place, the fundamental conceptions of insanity and of mental disease are different in scope, if not in quality. Dr. Southard has always correctly insisted that insanity is a legal diagnosis; mental disease or diseases, medical diagnosis. The point is very well taken that people show the evidences of their mental disorder in conduct, and that it is for conduct disorders that they are adjudged insane (or criminal, or feebleminded, etc.). But the editorial seems to me to involve a considerable mingling of concepts.

Practically considered, we may erect a basic classification of mental states which is logically defensible in this way:

Mental diseases (as is true of disease in general) may be due to defective development (early arrest) or to an active process (either self-limited and reversible, as in the manic depressive psychoses, or progressive as in paresis). To the first we have applied the name "feeblemindedness," to the second, psychosis.

We have also a group of defects or anomalies of development which are circumscribed in nature—which may, indeed often do, form the groundwork for the erection of a psychosis. There are the psychopathias or psychopathic personalities of Kraepelin. They are allied to the group with generalized defect.

Then there is a group with an active process, in which the twists are, so to speak, intramural *i. e.*, the alterations are largely confined to the individual. These are the psychoneuroses.

We may speak, then, of two major groups of mental diseases, each having two sub-groups:

I. Mental disease due to defective development.
  (*a*) General = "feebleminded."
  (*b*) Circumscribed=psychopathic personality

II. Mental disease due to an active process.
  (*a*) General=psychoses
  (*b*) circumscribed=psychoneuroses.

Within these four groups there are all types of intergradation. The distinction between some of them is often a matter of degree only (*vide* the dementia precox cases with prodromal psychoneurotic stage).

Now these are the mental diseases from the medical point of view. Any patient in any group *may be* insane in the legal sense or he may not be. We see at this hospital many patients with mental disease of one sort or other who are not insane. One of our important questions is "Is this patient also insane?"

I cannot agree *in toto* with the views expressed in the last paragraph. In the first place, we have been trying for some decades to get away from the point of view that the insane are to be outlawed. To revive this view means a reversion to the type of treatment which is fatal to the aims of society, and would retard the progress of psychiatry enormously.

Practically, there are two different types of cases to be sent to state hospitals. One type is dangerous to himself or the community. The other is the early case, especially dementia precox, without as yet any very serious social conflict, but one which we hope to save by early and intensive treatment.

It is this second type which we, as psychiatrists, especially want to reach. It is the first type with which the alienist is especially interested. There is here a very important distinction in terms.

To be sure, the psychiatrist cannot wholly divorce his work from legal ideas and standards, and he often must take the part of an alienist, but it is, I think, largely true that there is a decided difference in the relationship of the two to the patient and to the public.

It is perfectly true that the borderline between mental health and disease is very difficult to define. Yet as in other organs, pathological states may exist which are not of serious import. Yet even mild grades may very markedly impair responsibilty. Certainly many *criminals* are not entirely responsible without being feebleminded or psychotic. Here, however, the general social situation and standards are of great account.

We need, then, particularly to realize that psychiatry is concerned fully as much with the whole individual as in medicine in general, and, in addition, carries a larger social duty than any other branch of medicine. To achieve its ultimate aims, it must come in closer contact with society, and the psychiatrist and hospital for mental disease must be more accessible to the patient.

Yours very truly,
Lawson G. Lowrey, M.D.,
Chief-of-Staff.

RECENT DEATHS.

Dr. Henry A. Dunn, medical inspector in the United States Navy, died suddenly on December 13, in Brooklyn, N. Y. Dr. Dunn was 43 years of age, and in Government service for sixteen years. He had been assigned to the hospital ship *Havana*. He is survived by his widow and a son.

Dr. Alexander M. Wood of Cambridge, Mass., died at his home in that city recently. He was born at Richebucto, N. B., on August 5, 1835, and graduated from Harvard College in 1863. For a few years he practised medicine and then entered business, becoming the senior member of the A. M. Wood Lumber Company of Boston and Cambridge.

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